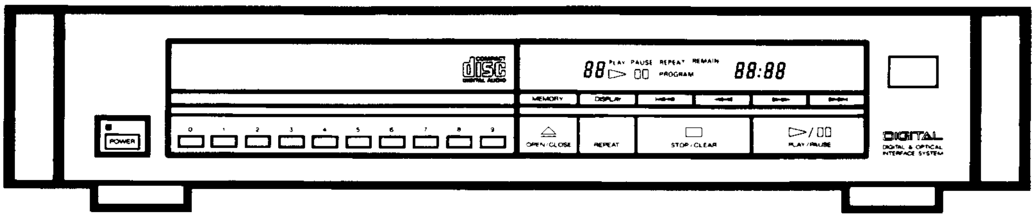
AKAI SERVICE MANUAL


PLAY PAUSE REPEAT REMAIN
PROGRAM
88:88
MEMORY
DISPLAY
POWER
0 1 2 3 4 5 6 7 8 9
OPEN/CLOSE
REPEAT
STOP/CLEAR
PLAY/PAUSE
DIGITAL
DIGITAL & OPTICAL INTERFACE SYSTEM

COMPACT DISC PLAYER
MODEL CD-M939

COMPACT
disc
DIGITAL AUDIO

I. SPECIFICATIONS

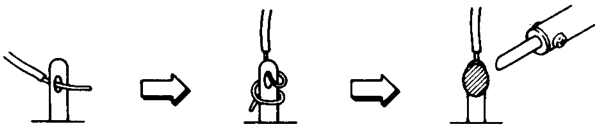
Type	Optical	**Dimensions**	385(W) × 74(H) × 330(D) mm (15.2 × 2.9 × 13.0 inches)
Pick-up system	3 beam semi-conductor laser	**Weight**	4.5 kg (9.9 lbs)
Wow & Flutter	Below measurable limits		
Output level/Impedance (Digital)	0.5Vp-p/75 ohms		
Power requirements	120V, 60 Hz for USA & Canada 220V, 50 Hz for Europe except UK 240V, 50 Hz for UK & Australia 110V/120V/220V/240V, 50 Hz/60 Hz convertible for other country		

* For improvement purposes, specifications and design are subject change without notice.

★ SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVIDING

1. Parts identified by the ⚠ symbols parts are critical for safety. Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation.
   These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note. especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 M ohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for $\boxed{C}$ or $\boxed{A}$, specified insulation resistance should be headphone jacks line-in-out jacks etc. more than 2.2 M ohms (ground terminals, microphone jacks).

★ INFORMATION

SYMBOL FOR PRIMARY DESTINATION

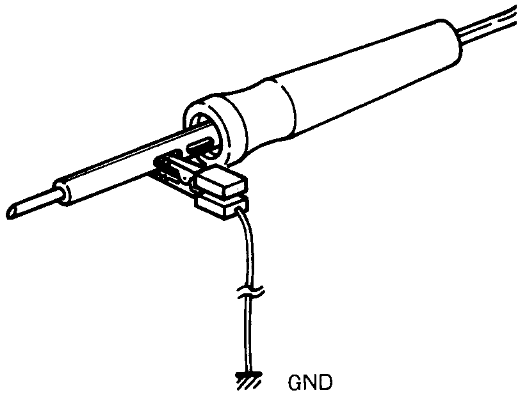
Alphabet indicates the destination of the units as listed below.

Symbols	Principal Destinations
$\boxed{A}$	USA
$\boxed{B}$	UK
$\boxed{C}$	Canada
$\boxed{E}$	Europe (except UK)
$\boxed{J}$	Japan
$\boxed{S}$	Australia
$\boxed{V}$	W. Germany only
$\boxed{U}$	Universal Area
$\boxed{Y*}$	Custom version

PRECAUTIONS IN REPAIRING

When repairing or adjusting the unit, please note the following points.

1. Do not put excessive pressure on the mechanical part (operation part), including the pick-up block, as extremely high mechanical precision is required in these parts.
2. When the base is removed for repair or adjustment, make sure that there are no metal objects in the narrow gap between the P.C. board or the mecha parts and the base.
3. The Micro-Computer (M50752 – 401 SP) and the CD signal processing ICs (M51564P and M50421P) can be damaged by static electricity or leakage from a soldering iron during repairing.
   While soldering, please take the precautions against leakage as in the illustration.
4. Do not loosen any screws in the pick-up block.
   When handling the pick-up block, please refer to the points to NOTE when replacing the pick-up block.
5. Keep safety from hazardous invisible Laser Radiation. DO NOT watch the Laser Beam (Objective Lens) directly.
6. Models for the same countries, Laser Warning Labels are affixed on the unit and inside of the unit, as shown below. Read it carefully for your safety, when repairing or adjusting the unit.



[DENMARK and U.K]

CLASS 1
LASER PRODUCT

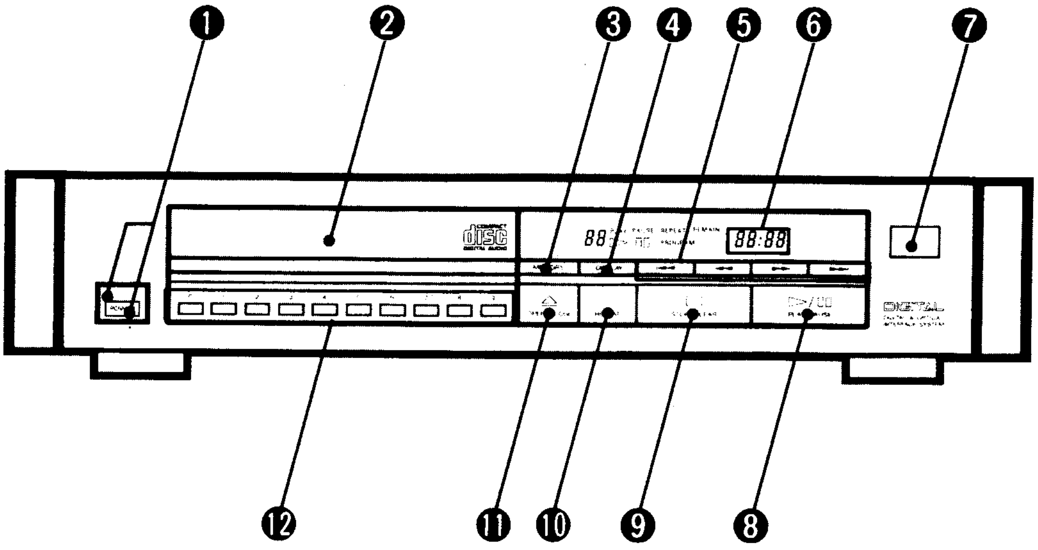
A Label affixed on the unit

CAUTION ; INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.

ADVARSEL ; USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.

A1 A Label affixed inside of the unit

I. CONTROLS



① POWER Switch and Indicator
To turn the Akai CD player ON and OFF.

② Disc drawer
Holds a compact disc.

③ MEMORY button
To memorize programs for random program playback. See page 11.

④ DISPLAY button
To choose the display mode, individual time, or remaining time mode display. See page 10.

⑤ SEARCH ⏮, ◀◀, ▶▶, ⏭ buttons
Use these buttons for skip and manual search operation. See page 9.

⑥ FL (Fluorescent) Display
Shows what mode the Akai CD player is in. See page 10.

⑦ Remote control window.
Keep clean for proper remote control operation.

⑧ PLAY/PAUSE ▷/▯▯ button
To start playback and to temporarily stop playback. See page 8.

⑨ STOP/CLEAR ▭ button
To clear a program or REPEAT play, or to STOP regular play back. See page 8.

⑩ REPEAT button
To replay a single selection or the entire disc. See page 12.

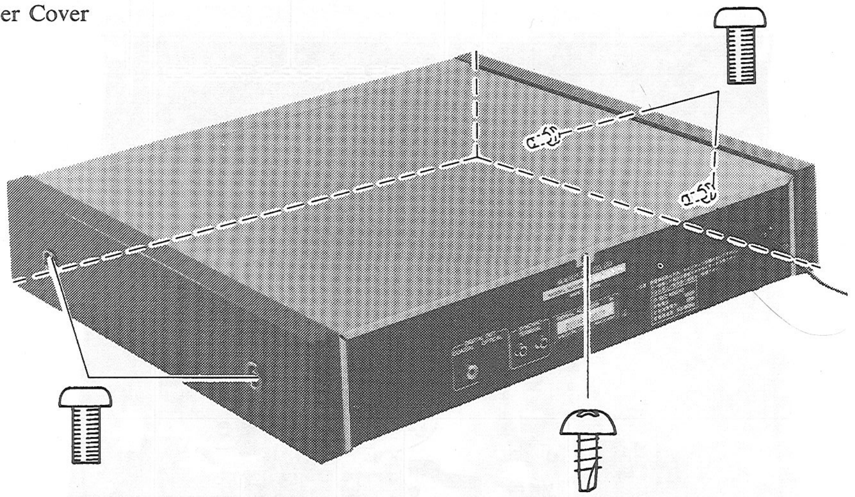
⑪ OPEN/CLOSE ≙ button
To load and eject compact discs, to stop compact disc playback and to cancel all the memorized programs. See page 5.

⑫ Numeric buttons (0 to 9)
Used for direct search and playback of a selection. Also used for programming during random program playback. See page 10 and 11.

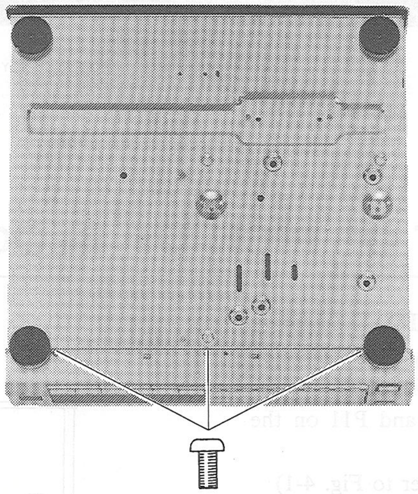
II. DISASSEMBLY

In case of trouble, etc, necessitating dismantling, please dismantle in the order shown in the photographs.
Reassemble in reverse order.

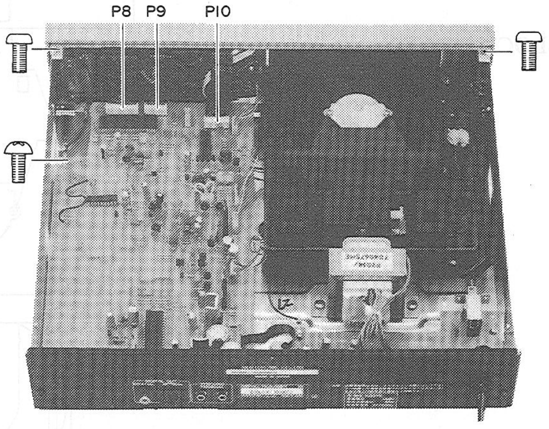
1. Removal of Upper Cover



2. Removal of Front Pannel



3.



* Before remove the Front panel, disconnect the connectors P7, P8, P9 and P10. (while disconnecting the wire from the connector, press upper side of connector.)

III. PRINCIPAL PARTS LOCATION

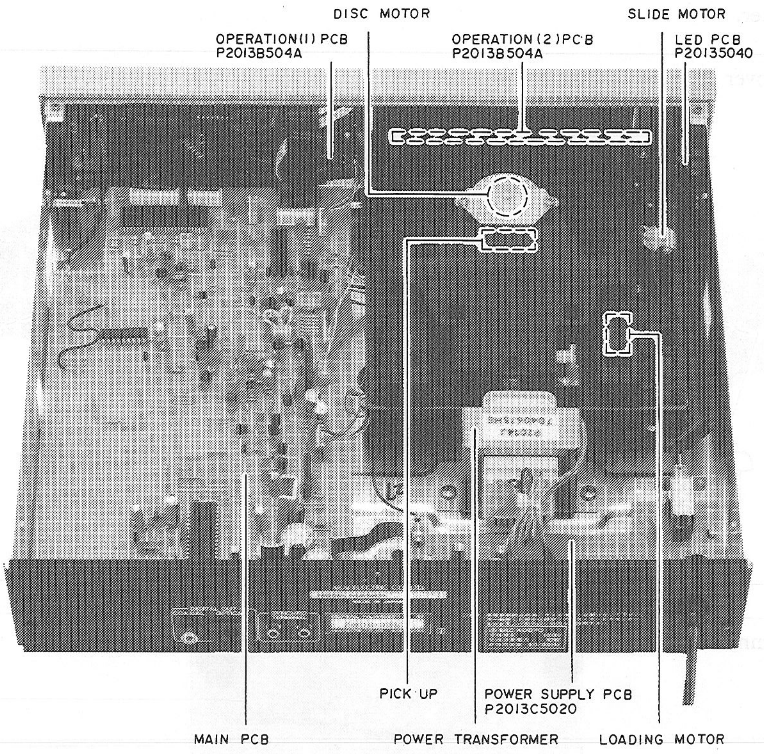

DISC MOTOR
SLIDE MOTOR
OPERATION(1) PCB P2013B504A
OPERATION (2) PCB P2013B504A
LED PCB P20135040
PICK UP
POWER SUPPLY PCB P2013C5020
MAIN PCB
POWER TRANSFORMER
LOADING MOTOR

Fig. 3-1

IV. REPLACEMENT OF PICK-UP BLOCK

4-1. REMOVAL OF THE MECHANICAL BLOCK

① While power is on, set the disc tray to open condition by press the OPEN/CLOSE button, then turn off the power.

② Disconnect the connectors P1, P2, P4 and P11 on the MAIN PCB.

③ Remove the screws Ⓐ, Ⓑ and Ⓒ. (Refer to Fig. 4-1)

④ Press the disc tray and set the disc tray to close condition.

⑤ Remove the FRONT PANEL.
(Refer to I. DISASSEMBLY)

⑥ Remove the MECHANICAL BLOCK from the main chassis.

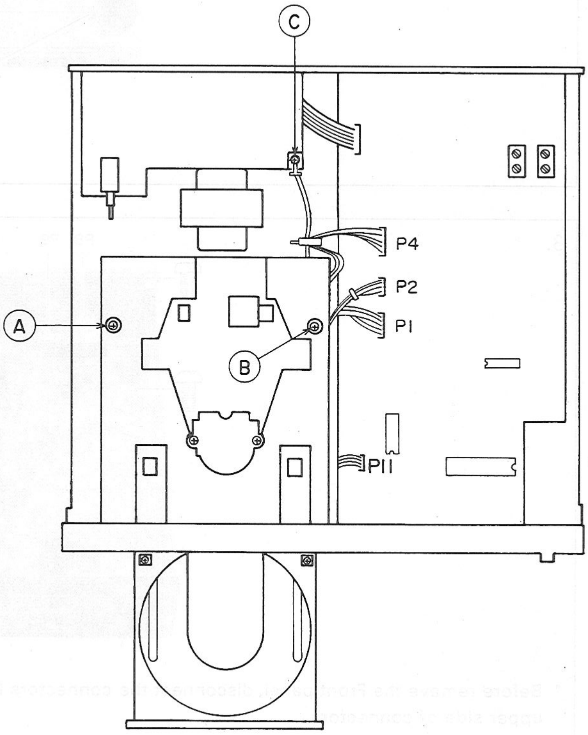

C
A
B
P4
P2
P1
P11

Fig. 4-1

4-2. REMOVAL OF THE PICK-UP BLOCK

1) Remove the E ring Ⓓ, then remove the gear Ⓔ.
2) Remove the screws Ⓗ, Ⓘ, Ⓙ and Ⓚ which fixed guide shaft.
3) Disconnect the connectors (6 pin and 9 pin connectors) on the pick-up block, then remove the pick-up block.
4) Remove the pick-up fixing screws Ⓛ, Ⓜ and Ⓝ.

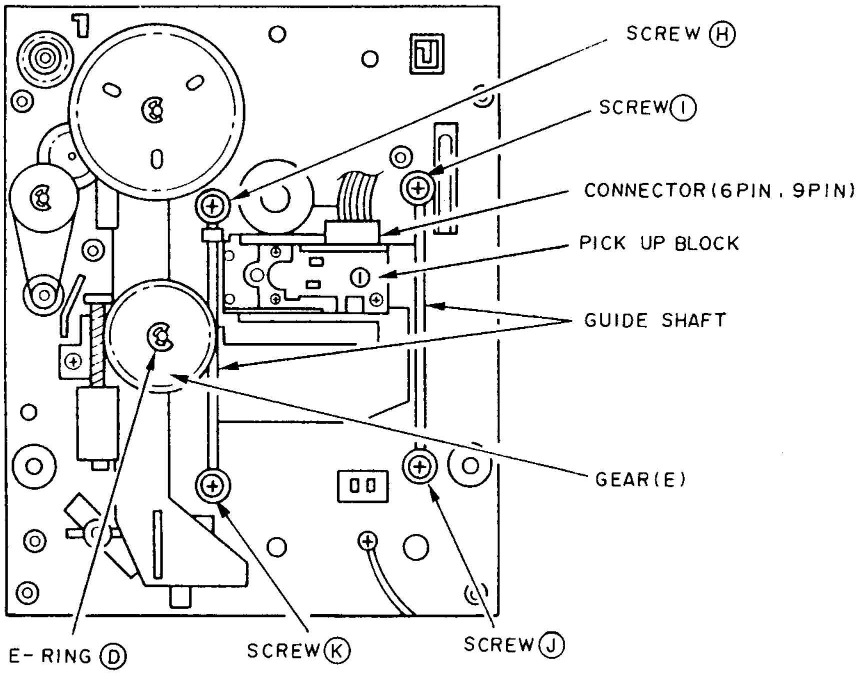

SCREW Ⓗ
SCREW Ⓘ
CONNECTOR (6PIN, 9PIN)
PICK UP BLOCK
GUIDE SHAFT
GEAR (E)
E-RING Ⓓ
SCREW Ⓚ
SCREW Ⓙ

Fig. 4-2

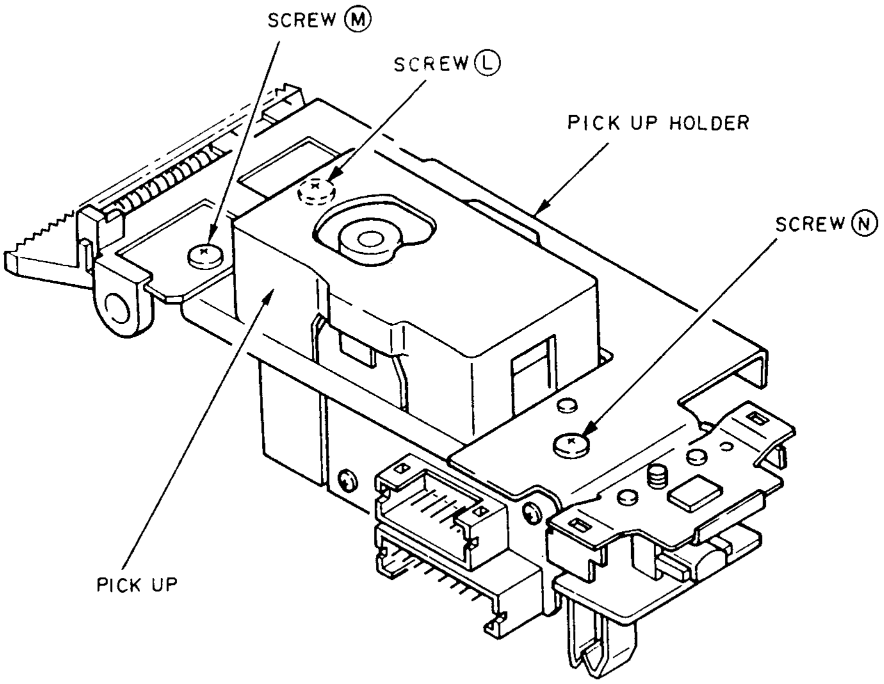

SCREW Ⓜ
SCREW Ⓛ
PICK UP HOLDER
SCREW Ⓝ
PICK UP

Fig. 4-3

4-3. ADJUSTMENT OF THE PICK-UP BLOCK WHILE SERVICING

4-3-1. Pick-up Inclination Adjustment

Fine inclination adjustment in the jitter direction is necessary after replacing the pick-up. Adjustment is performed by rotating the Jitter Direction Inclination Adjustment Screw. (Refer to Fig. 4-4)

1) Connect the oscilloscope between P5 pin ① (HF signal) and GND.
2) Set the unit in the TEST MODE 4.

   NOTE: "How to make test Mode" has been written in VII. ELECTRICAL ADJUSTMENT (SERVO).
3) Press the (FF) or (FR) Buttons so that the Jitter Direction Adjustment Screw may situate to the middle of the Inclination Adjustment Hole.
4) Confirm that the HF signal (Eye-Pattern) shown in Fig. 4-5.
5) Turn right and left the Jitter Direction Adjustment Screw (Fig. 4-4) with the hexagonal driver (2.4 mm) until the HF Signal pattern change from (A) to (B) in Fig. 4-6.
6) After adjustment confirm that the HF signal level is within the range indicated below.

   Check that HF signal pattern is clear as shown in Fig. 4-6 B.

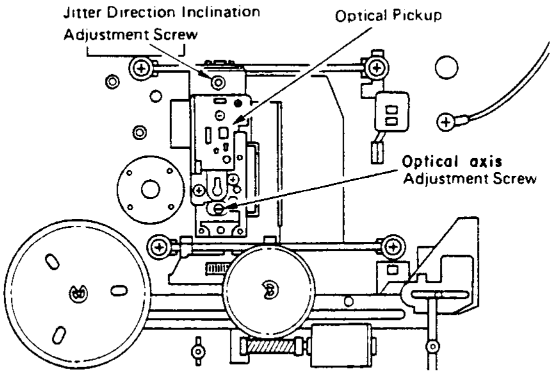

Jitter Direction Inclination Adjustment Screw
Optical Pickup
Optical axis Adjustment Screw

Fig. 4-4

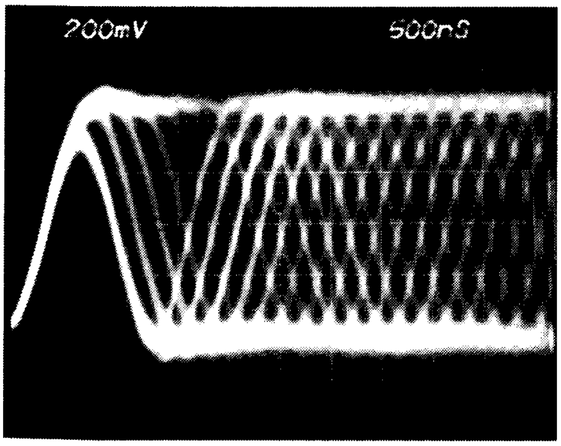
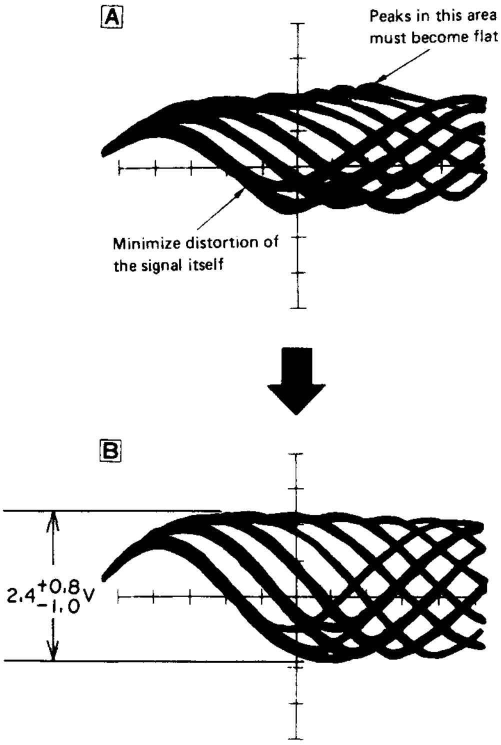


Fig. 4-5


A
Peaks in this area must become flat
Minimize distortion of the signal itself
B
2.4 +0.8 -1.0 V

(A): HF Signal before jitter direction adjustment
(B): HF Signal after jitter direction adjustment

Fig. 4-6

4-3-2. ADJUSTMENT OF THE FOCUS OFF-SET

When indication of the Frequency Counter is not decrease than 120 Hz in the VII. ELECTRICAL ADJUSTMENT (SERVO) step 2 FOCUS SERVO OFF-SET adjustment.

Put the washer 0.2 mm (Parts No. ZW-259650) between pick-up and pick-up holder as shown in Fig. 4-7.

After this adjustment all the adjustments in VII. ELECTRICAL ADJUSTMENT (SERVO) are necessary.

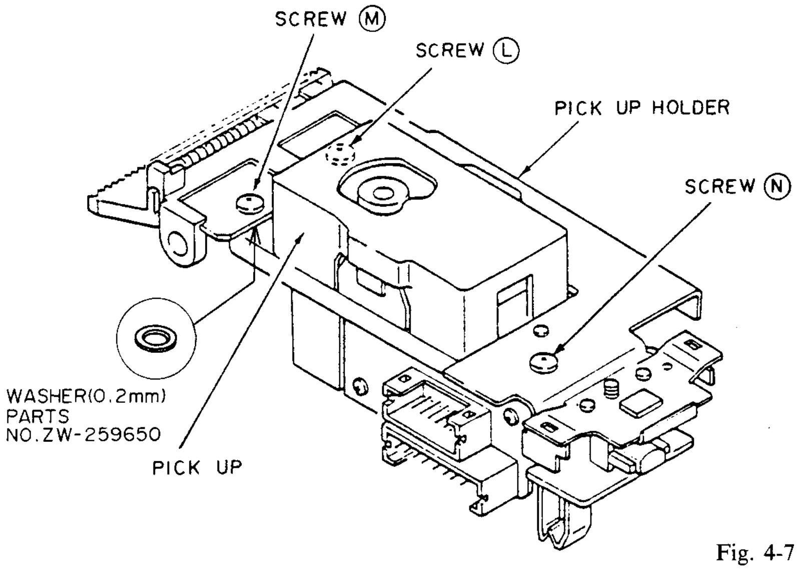

SCREW Ⓜ
SCREW Ⓛ
PICK UP HOLDER
SCREW Ⓝ
WASHER(0.2mm)
PARTS
NO.ZW-259650
PICK UP

Fig. 4-7

4-3-3. APC (Automatic Power Control)

This circuit is to keep the constant laser power of the pick-up, semi-fixed resister VR 1 on the pick-up block is adjusted at the factory according to each character of the pick-up, consequently, “DO NOT TOUCH THIS VR 1”.

V. REPLACEMENT OF SPINDLE MOTOR

5-1. REMOVE AND ASSEMBLY SPINDLE

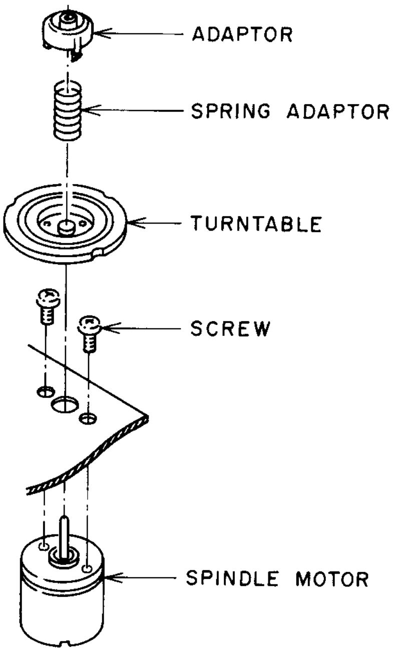

ADAPTOR
SPRING ADAPTOR
TURNTABLE
SCREW
SPINDLE MOTOR

Fig. 5-1

1) Pull out the turntable, Spring adaptor and Adaptor.
2) Remove the two Screws.
3) Unsolder two Spindle Motor wires.
4) Solder two wires to the new Spindle Motor.
5) Put the new Spindle Motor on the chassis with two screws.
6) Press-in the turn table on to the Motor shaft.
   Adjust the turntable so that the hight of the turntable from chassis become 6.6 ± 0.1 mm (Fig. 5-2).

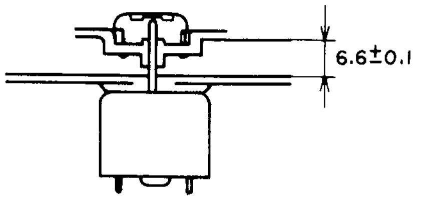


Fig. 5-2

VI. HOW TO INSTALL OF THE LOADING MECHANISM

1. Set the Disc Tray in a loading condition.
2. Set the gear (B) on the shaft (G).
   When the gear (B) is set properly, fit the Hole of the gear (B) to the hole of the CHASSIS. (Fig. 6-1)
3. Press the Lever-outsert to fully direction (D). (Fig. 6-1)
4. Set the gear (C) on the shaft (H).
   When the gear (C) is set properly, fit the MARK (E) to the MARK (F). (Fig. 6-1)
5. Set the gear (A) on the shaft (I).
   When the gear (A) is set properly, fit the Hole of the gear (A) to the Hole of the CHASSIS. (Fig. 6-1)

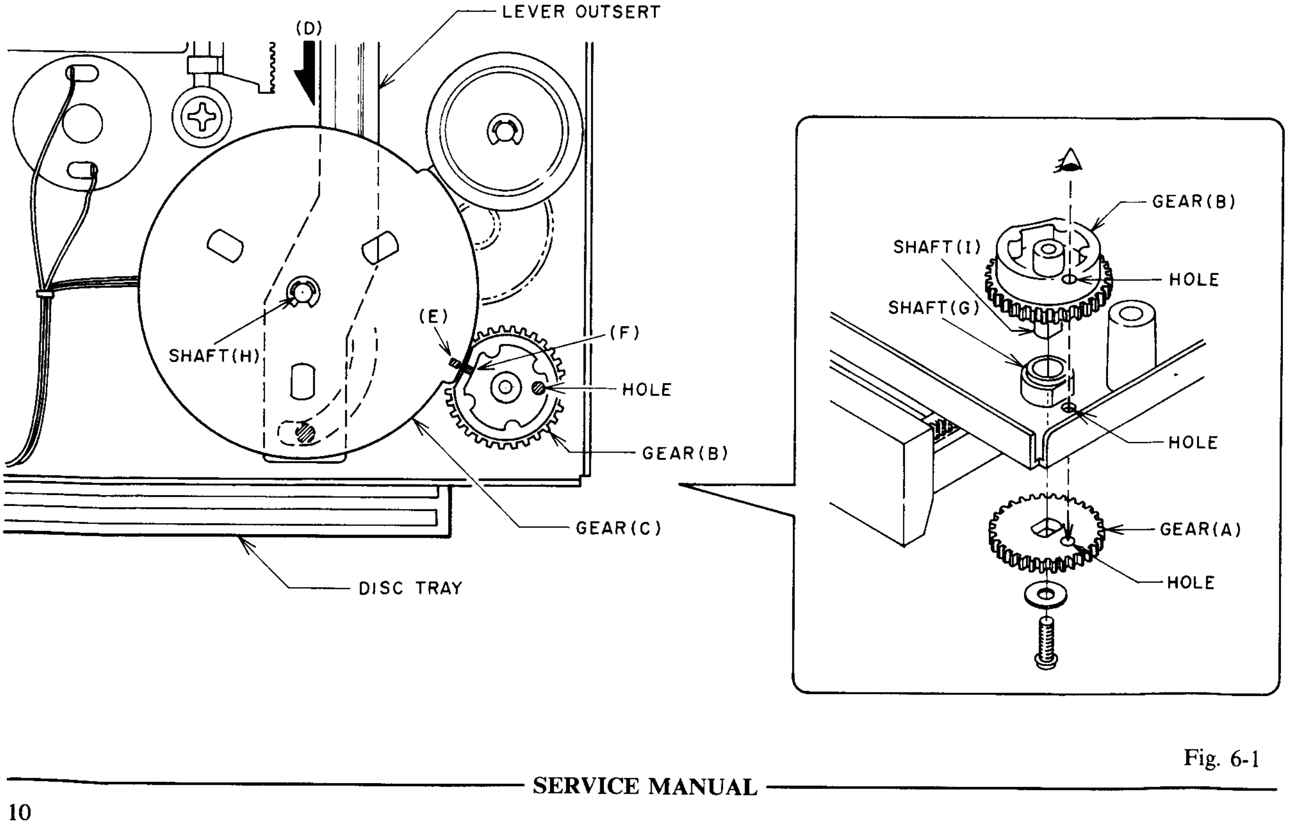
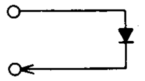

LEVER OUTSERT
(D)
(E)
(F)
SHAFT(H)
HOLE
GEAR(B)
GEAR(C)
DISC TRAY
GEAR(B)
SHAFT(I)
HOLE
SHAFT(G)
HOLE
GEAR(A)
HOLE

Fig. 6-1

VII. ELECTRICAL ADJUSTMENT (SERVO)

ABOUT THE TEST MODE

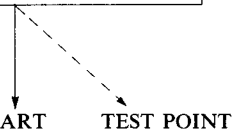
- * This test mode use for the adjustment or check.
- * Short the pin 1 and 2 of the connector P12 and turn on the power. Indication of the display on the front panel is "0 TEST" when set to the test mode.
- * Operation key on the front panel does not accept while in the test mode.
- * When release from the test mode, turn the power off.
- * When change the test mode NO., short the pins of the connecter P13 as shown below.



TEST MODE OPERATION DISPLAY AND FUNCTION

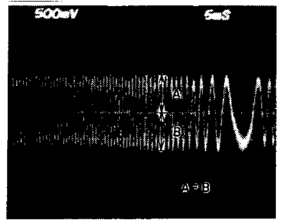
OPERATION	TEST MODE DISPLAY	FUNCTION
ON Pin ② – Pin ⑥	0 TEST	* Laser diode "OFF" * All servo "OFF" * Short pin ⑥→②. Brake mode from disc motor is rotating
Pin ⑥ – Pin ③	1 TEST	* Laser diode "ON"
Pin ⑥ – Pin ③	2 TEST	* Focus servo "ON"
Pin ⑥ – Pin ③	3 TEST	* Only when focus servo is normal condition Disc motor rotate Audio mute release
Pin ⑥ – Pin ①	4 TEST	* Track servo "ON" * Slide servo "ON"
Pin ⑤ – Pin ③	———	* Pick up move to FF direction
Pin ⑤ – Pin ②	———	* Pick up move to FR direction
Pin ④ – Pin ①	———	* Open and close of disc tray

NO.	ADJUSTMENT ITEM
	1. TEST DISC 2. TEST MODE NO. 3. TEST POINT & INSTRUMENT 4. ADJUSTMENT PART 5. RESOLT & REMARKS



3 E-F BALANCE

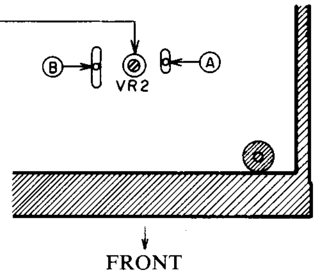
1. TEST DISC TYPE III (AT-711881)
2. Test mode 3
3. Connect an oscilloscope to pin ② of connector P5.
4. VR2
5. A = B (DC Range)



4 OPTICAL AXIS

1. TEST DISC TYPE III (AT-711881)
2. Test mode 3
3. Connect an oscilloscope to pin ② of connector P5.
4. Adjustment screw A
5. Adjust screw A so that the waveform level on the oscilloscope is maximum.

* Before adjustment, move the pick-up so that coinside the adjustment window and adjustment screw A as shown below.



* If the eye pattern is not clear, repeat step 2 FOCUS SERVO OFF-SET adjustment.

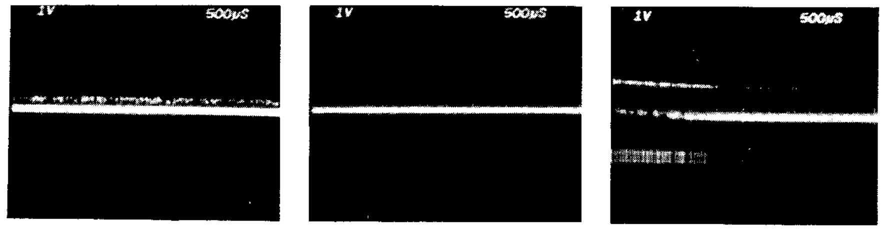
1 TRACKING SERVO OFF-SET

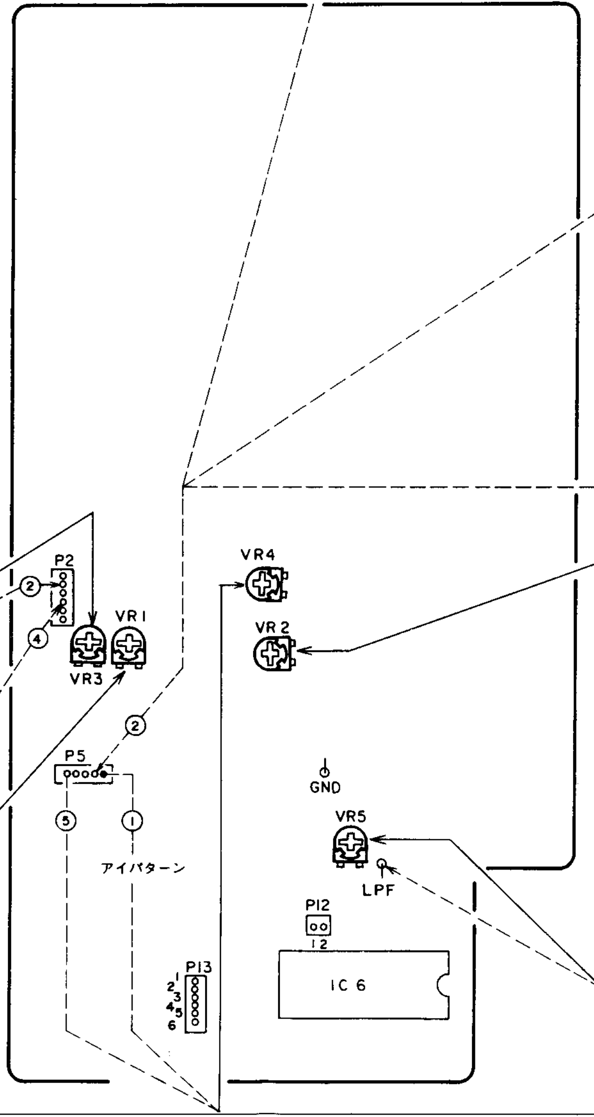
1. -----
2. Test mode 1
3. Connect an oscilloscope between pin ② of connector P5 and GND
4. VR2
5. 0 ± 5mV (DC Range)

7 PLL FREQUENCY

1. TEST DISC TYPE III (AT-711881)
2. Test mode 4
3. Connect an oscilloscope and a digital DC voltmeter between test pin LPF and GND.
4. VR5
5. Slightly turn the VR5 to counterclockwise so that the noise appear as in Fig A, then turn the VR5 to clockwise and measure with adigital voltmeter at the point noise disappear. (voltage A) Then slightly turn the VR5 to clockwise so that the noise appear as in Fig. B, then turn the VR5 to counterclockwise and mesure with a digital voltmeter at the point noise disappear. (voltage B)

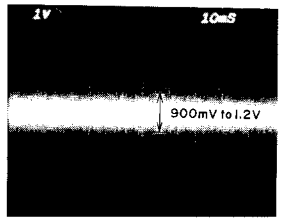
Set the VR5 at the point of A + B/2 V with the digital voltmeter.





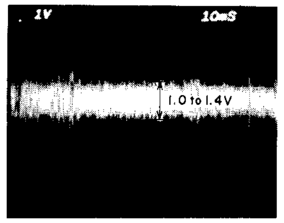
6 FOCUS SERVO GAIN

1. TEST DISC TYPE III (AT-711881)
2. Test mode 4
3. Connect an oscilloscope to pin ② of connector P2.
4. VR3
5. 1.0 to 1.4V p-p.



5 TRACKING SERVO GAIN

1. TEST DISC TYPE III (AT-711881)
2. Test mode 4
3. Connect an oscilloscope to pin ④ of connector P2.
4. VR1
5. 0.9 to 1.2V p-p.



2 FOCUS SERVO OFF-SET (PICK UP MLP-4D2 TYPE)

(PICK UP MLP-4F TYPE)

1. TEST TYPE III. (AT-711881)
2. Test mode 2 and 0.
3. Connect an oscilloscope (DC range) between pin 3 of P5 and GND.
4. VR4.
5. Measure the DC voltage at test mode 2, then set to test mode 0, and adjust VR4 so that the DC voltage at test mode 0 is equal as the DC voltage at test mode 2.

(PICK UP MLP-4D2 TYPE)

1. TEST DISC TYPE III (AT-711881)
2. Test mode 4
3. Connect a frequency counter between pin ⑤ of connector P5 and GND, and connect an oscilloscope between pin ① of connector P5 and GND.
4. VR4
5. Turn the VR4 within the ± 20° from the center so that the indicated frequency on the frequency counter is minimum. (should be less than 120Hz)

Note: * Use the disc without scratches.
* If the minimum point is out of ± 20° from the center of VR4, refer to the 4-3-1 ADJUSTMENT OF THE FOCUS OFF-SET.
* Confirm that the eye pattern on the oscilloscope is clear

VIII. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

A small "x" indicates that this part is not shown in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure.

This number corresponds with the Figure Number.

b) PC Board

6. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
6-C1B	EC-350949	C MMY V 223M 250DC [J]
6-C1C	EC-338397	C MMY V 223M 125AC [C,A]
6-X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A]: AAL(U.S.A.)	[S]: SAA(Australia)
[B]: BEAB(England)	[U]: U/T(Universal Area)
[C]: CSA(Canada)	[V]: VDE(W. Germany)
[E]: CEE(Europe)	[Y]: Custom Version
[J]: JPN(Japan)	

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ (∗) INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ (∗) IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LÉ FABRICANT.

1. RECOMMENDED SPARE PARTS

Ref. No.	Part No.	Description
1	BB-P2016A290B	NEW 4 MECHA BLK CD-M712 [FORMER]
2	BM-371552	MOTOR RD-050Y-10240 [M901 LOADING MOTOR]
3	BM-376851	MOTOR RF-310T-11400 31.5MM SHAFT [M902 DISC MOTOR]
4	BO-374151	PICK UP MLP-4D2 [FORMER]
5	BO-372165	PICK UP MLP-4F [NEW]
6	∗BT-374172	TRANS POW P2014(B,S) [B] [T901]
7	∗BT-374171	TRANS POW P2014(E,V) [E,V] [T901]
8	BT-368261	TRANS PULSE TC-1027-04
9	ED-370976	D LED SLB-22PW3 [POWER]
10	ED-360409	D PHOTO PN323B
11	ED-361055	D SILICON DS135E-UB1
12	ED-301911	D SILICON H DS448
13	ED-344280	D SILICON H GMA-01-FY2 F05
14	ED-306724	D SILICON S5277B 100/1.0A
15	∗ED-372125	D SILICON 11DF1 100/1.0A
16	∗ED-346620	D ZENER H HZ27 2
17	ED-331198	D ZENER H HZ3 A1
18	∗ED-338333	D ZENER H HZ5 B2
19	ED-346532	D ZENER H HZ7L A3
20	EH-380185J	FILTER EMI ZBF503S-01
21	EI-371091	IC CXD1075P
22	EI-371544	IC M5M4416P-15
23	EI-371082	IC M50421P
24	EI-372196	IC M50752-402SP
25	EI-375360	IC M50763-464SP CUSTOM
26	EI-371079	IC M51564P
27	EI-371570	IC M54544L
28	EI-371554	IC STA341M
29	EI-371579	IC S8054ALB
30	∗EI-315243	IC TA78005AP
31	∗EI-362977	IC TA79005P
32	EI-360040	IC TC74HCU04P
33	EI-367271	IC UPC1490HA
34	EI-348409	OSC CE CSB400P 0.400000MHZ
35	EI-374176	OSC X'TAL AT-51 16.9344MHZ
36	EM-374177	IND FL 7-BT-83GK
37	∗ER-366452	R FUSE H RF25SJ 1/4W 4R7J
38	ES-371577	SW LEAF MSW-1353NBKP [SW912 CLOSE SW]
39	ES-368075	SW LEAF MSW-17600MVCO [SW911 INNER SW]
40	ES-368077	SW MICRO MQS-1BAN [SW913 OPEN SW]
41	∗ES-371104	SW PUSH SDDLD1082A 01-1 [POWER SW]
42	ES-362883	SW TACT SKHHLM
43	ES-360576	SW TACT SKHHPM
44	ET-371075	TR DTA124XS
45	ET-354094	TR DTC144WS
46	ET-308472	TR 2SA1115 E,F,G F05
47	ET-379668J	TR 2SA1392 S,T F05
48	ET-372199	TR 2SA1515 R
49	ET-308141	TR 2SC2603 G F05
50	ET-338410	TR 2SC2878 A,B
51	ET-372197	TR 2SC3377 R
52	MB-202578	BELT GUM

2. MECHA BLOCK

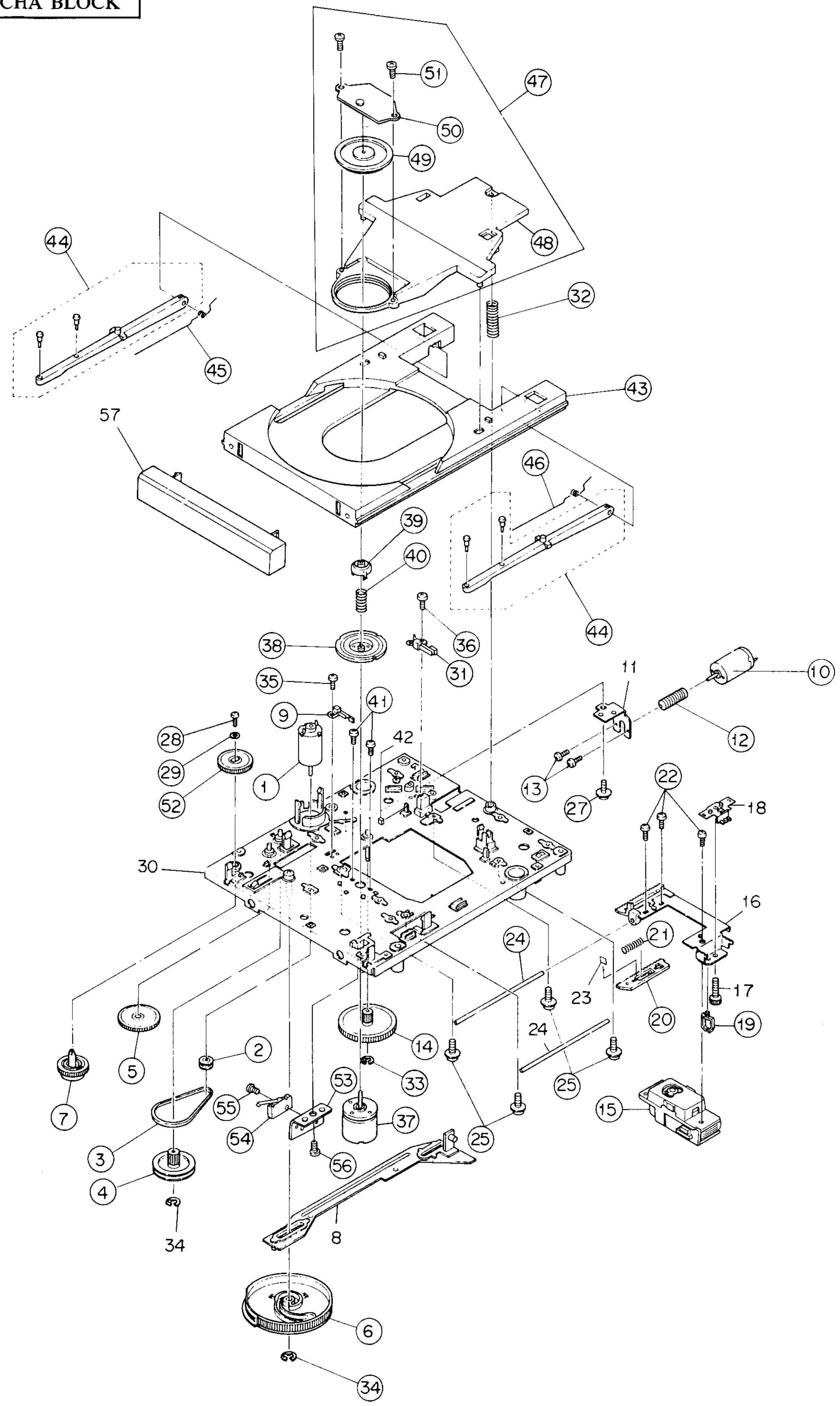
Ref. No.	Part No.	Description
1	BM-371552	MOTOR RD-050Y-10240 [M901 LOADING MOTOR]
2	MR-202576	PULLEY A
3	MB-202578	BELT GUM
4	MR-202579	PULLEY B
5	MZ-202580	GEAR D
6	MZ-202581	GEAR C
7	MZ-202582H05	GEAR B
9	ES-368075	SW LEAF MSW-17600MVCO [SW911 INNER SW]
10	BM-371552	MOTOR RD-050Y-10240 [M903 SLIDE MOTOR]
12	MZ-202426	WORM GEAR
13	ZS-365329	PAN20X03STL BDY PS3
14	MZ-202405	GEAR S
15A	BO-374151	PICK UP MLP-4D2 [FORMER]
15B	BO-372165	PICK UP MLP-4F [NEW]
20	MZ-202514	RACK SLIDE B
21	ZG-202515	SP RACK
22	ZS-419782	BID26X05STL CMT
25	ZS-297641	T2BID30X08STL CMT PW100
26	ZW-259650	PW30X050X020PBR
27	ZS-315511	ST PAN30X06STL CMT CUP
28	ZS-283353	T2BID20X08STL CMT
29	ZW-429120	PW23X090X050STL CMT
31	ES-371577	SW LEAF MSW-1353NBKP [SW912 CLOSE SW]
32	ZG-202570H03	SP CLAMP
33	ZW-329299	RING E200SUP CMT
34	ZW-410051	RETAINING RING E250SUP CMT
35	ZS-365353	PAN17X04STL BDY PS3
36	ZS-370834	BID26X05STL BDY
37	BM-376851	MOTOR RF-310T-11400 31.5MM SHAFT [M902 DISC MOTOR]
38	MZ-202572	TURN TABLE CD
39	MZ-202573H03	ADAPTOR
40	ZG-202574H02	SP ADAPTOR
41	ZS-367463	PAN20X025STL CMT
43	SC-202557H07	DISC TRAY
44	BZ-P2016A240A	NEW DISC HOLDER BLK CD-A405
45	ZG-203098	SP HOLDER L
46	ZG-203099	SP HOLDER R
47	BZ-P2016A250A	NEW DISC CLAMPER BLK CD-A405
51	ZS-367436	PT BID30X05STL CMT
52	MZ-202575H04	GEAR A
54	ES-368077	SW MICRO MQS-1BAN [SW913 OPEN SW]
55	ZS-368088	PAN17X06STL BDY PS3
56	ZS-371013	ST BID30X05STL BDY
57-B	BD-B374165B	PANEL TRAY PART CD-M939-B
57-G	BD-B374165A	PANEL TRAY PART CD-M939-G

NOTE
B – Black
G – Gold

3. P.C BOARD BLOCK

Ref. No.	Part No.	Description
1A	BA-P2014A030A	:PC MAIN BLK: CD-M939 [FORMER]
1B	BA-P2014A030D	PC MAIN BLK CD-M939(F) [NEW]

MECHA BLOCK



4. MAIN P.C BOARD

Ref. No.	Part No.	Description
D1	ED-344280	D SILICON H GMA-01-FY2 F05
D2	ED-361055	D SILICON DS135E-UB1
D3	ED-361055	D SILICON DS135E-UB1
D4	ED-361055	D SILICON DS135E-UB1
D5	∗ED-301911	D SILICON H DS448
D6	∗ED-301911	D SILICON H DS448
D7	∗ED-301911	D SILICON H DS448
D8	∗ED-301911	D SILICON H DS448
D9	ED-344280	D SILICON H GMA-01-FY2 F05
D10	ED-344280	D SILICON H GMA-01-FY2 F05
D11	ED-301911	D SILICON H DS448
D12	ED-301911	D SILICON H DS448
D14	ED-346532	D ZENER H HZ7L A3
D15	ED-344280	D SILICON H GMA-01-FY2 F05
D17	ED-344280	D SILICON H GMA-01-FY2 F05
D18	ED-344280	D SILICON H GMA-01-FY2 F05
D19	ED-344280	D SILICON H GMA-01-FY2 F05
D20	ED-344280	D SILICON H GMA-01-FY2 F05
D21	ED-338333	D ZENER H HZ5 B2
D22	ED-331198	D ZENER H HZ3 A1
FL2	EH-380185J	FILTER EMI ZBF503S-01
FR1	∗ER-366452	R FUSE H RF25SJ 1/4W 4R7J
IC1	EI-371079	IC M51564P
IC2	EI-371554	IC STA341M
IC3	EI-371082	IC M50421P
IC4	EI-371544	IC M5M4416P-15
IC5	EI-375360	IC M50763-464SP CUSTOM
IC6	EI-372196	IC M50752-402SP
IC7	EI-371570	IC M54544L
IC8	EI-371579	IC S8054ALB
IC9	∗EI-315243	IC TA78005AP
IC10	∗EI-362977	IC TA79005P
IC15	EI-371091	IC CXD1075P
IC16	EI-360040	IC TC74HCU04P
J2	EJ-372185	PHONE J 3P HSJ0857-01-320
J3	EJ-372185	PHONE J 3P HSJ0857-01-320
J4	EJ-374175	PIN J JPJ2048-01-060 1P
L1	EO-345924	COIL FIX 1 LAL03KH 680K
L2	EO-345931	COIL FIX 1 LAL03KH 221K
L4	EO-345931	COIL FIX 1 LAL03KH 221K
L5	EO-345922	COIL FIX 1 LAL03KH 470K
L6	EO-345902	COIL FIX 1 LAL03KH 1R0M
P1	EJ-374191	SOCKET OPTICAL TOTX172
PT1	BT-368261	TRANS PULSE TC-1027-04
TR1	ET-372197	TR 2SC3377 R
TR2	ET-372199	TR 2SA1515 R
TR3	ET-372197	TR 2SC3377 R
TR4	ET-372199	TR 2SA1515 R
TR5	ET-308141	TR 2SC2603 G F05
TR6	ET-308141	TR 2SC2603 G F05
TR7	ET-308141	TR 2SC2603 G F05
TR8	ET-371075	TR DTA124XS
TR9	ET-371075	TR DTA124XS
TR10	ET-371075	TR DTA124XS
TR11	ET-371075	TR DTA124XS
TR12	ET-308141	TR 2SC2603 G F05
TR14	ET-379668J	TR 2SA1392 S,T F05
TR16	ET-308472	TR 2SA1115 E,F,G F05
TR19	ET-308141	TR 2SC2603 G F05
TR20	ET-308141	TR 2SC2603 G F05
TR21	ET-338410	TR 2SC2878 A,B
TR22	ET-354094	TR DTC144WS
TR23	ET-354094	TR DTC144WS
TR24	ET-308141	TR 2SC2603 G F05
TR25	ET-308472	TR 2SA1115 E,F,G F05
TR26	ET-308141	TR 2SC2603 G F05
VR1	EV-356577	R S-FIX H RH0615C 0.10W 103
VR2	EV-356577	R S-FIX H RH0615C 0.10W 103
VR3	EV-356577	R S-FIX H RH0615C 0.10W 103
VR4	EV-356577	R S-FIX H RH0615C 0.10W 103
VR5	EV-357619	R S-FIX H RH0615C 0.10W 104
X2	EI-374176	OSC X'TAL AT-51 16.9344MHZ
X3	EI-348409	OSC CE CSB400P 0.400000MHZ

5. POWER SUPPLY P.C BOARD

Ref. No.	Part No.	Description
C12	∗EC-338496	C CE V FZ 472P 400AC
D1	∗ED-372125	D SILICON 11DF1 100/1.0A
D2	∗ED-372125	D SILICON 11DF1 100/1.0A
D3	∗ED-372125	D SILICON 11DF1 100/1.0A
D4	∗ED-372125	D SILICON 11DF1 100/1.0A
D5	ED-306724	D SILICON S5277B 100/1.0A
D6	ED-306724	D SILICON S5277B 100/1.0A
D7	ED-306724	D SILICON S5277B 100/1.0A
D8	ED-306724	D SILICON S5277B 100/1.0A
D9	∗ED-346620	D ZENER H HZ27 2
D10	∗ED-338333	D ZENER H HZ5 B2
SW1	∗ES-371104	SW PUSH SDDLD1082A 01-1 [POWER SW]

6. OPERATION (1) P.C BOARD

Ref. No.	Part No.	Description
IN1	EM-374177	IND FL 7-BT-83GK
TS1	ES-360576	SW TACT SKHHPM
TS2	ES-360576	SW TACT SKHHPM
TS3	ES-360576	SW TACT SKHHPM
TS4	ES-360576	SW TACT SKHHPM
TS5	ES-360576	SW TACT SKHHPM
TS6	ES-360576	SW TACT SKHHPM
TS7	ES-360576	SW TACT SKHHPM
TS8	ES-360576	SW TACT SKHHPM
TS9	ES-360576	SW TACT SKHHPM
TS10	ES-360576	SW TACT SKHHPM
1	SZ-372107	CUSHION FLD

7. OPERATION (2) P.C BOARD

Ref. No.	Part No.	Description
TS11	ES-362883	SW TACT SKHHLM
TS12	ES-362883	SW TACT SKHHLM
TS13	ES-362883	SW TACT SKHHLM
TS14	ES-362883	SW TACT SKHHLM
TS15	ES-362883	SW TACT SKHHLM
TS16	ES-362883	SW TACT SKHHLM
TS17	ES-362883	SW TACT SKHHLM
TS18	ES-362883	SW TACT SKHHLM
TS19	ES-362883	SW TACT SKHHLM
TS20	ES-362883	SW TACT SKHHLM

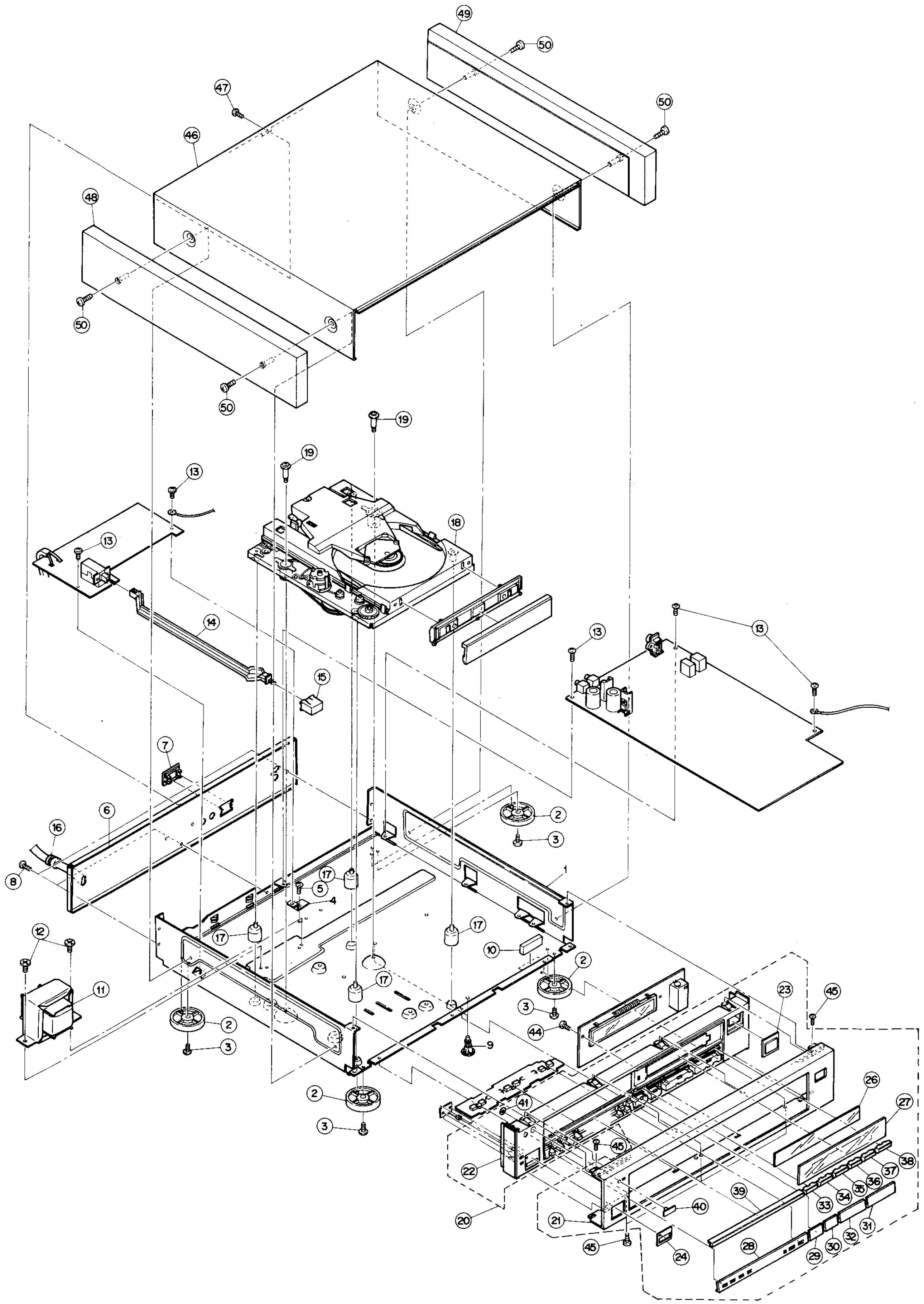
8. SENSOR P.C BOARD

Ref. No.	Part No.	Description
D1	ED-360409	D PHOTO PN323B
IC1	EI-367271	IC UPC1490HA

9. LED P.C BOARD

Ref. No.	Part No.	Description
D201	ED-370976	D LED SLB-22PW3 [POWER]

FINAL ASSEMBLY BLOCK



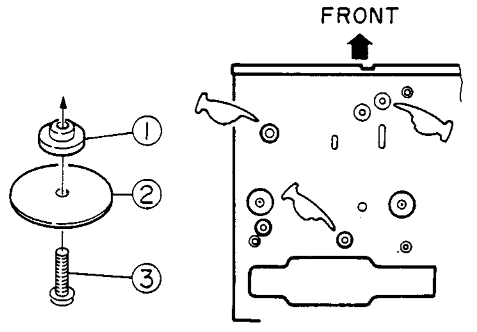
10. FINAL ASSEMBLY BLOCK

Ref. No.	Part No.	Description
2	SA-376945J	FOOT(2) PART
3	ZS-351186	ST BR30X08STL CMT C080
5	ZS-353355	CT BR30X06STL BZN PROJECTION
6A	SP-378533J1	PANEL REAR CD-M939(E) [E]
6B	SP-378534J1	PANEL REAR CD-M939(V) [V]
6C	SP-378535J1	PANEL REAR CD-M939(B) [B]
7	SE-375348	ESCUTCHEON
8	ZS-308673	T2PAN30X20STL NI3 GUIDE
11A	∗BT-374171	TRANS POW P2014(E,V) [E,V] [T901]
11B	∗BT-374172	TRANS POW P2014(B,S) [B] [T901]
12	ZS-313796	ST BID40X06STL CMT
13	ZS-336351	T2BR30X08STL NI3
14	MZ-370925	JOINT POWER
15-B	SK-370688B-A	KNOB POWER(B)
15-G	SK-370688A-A	KNOB POWER (G)
16A	∗EW-363672	AC CORD 200 0364 LCFL B070 A EV [E,V]
16B	∗EW-363684	AC CORD 200 LCFL B070 A B [B]
17	SZ-370924	CUSHION RUBBER
18A	BB-P2016A290B	NEW 4 MECHA BLK CD-M712 [FORMER]
18B	BB-P2016A290A	NEW 4 MECHA BLK CD-A405 [NEW]
19	ZS-202631	SCREW-METAL
20-B	BD-P2014A050A	PANEL FRONT BLK CD-M939-B [INCL. 21 TO 41]
20-G	BD-P2014A050B	PANEL FRONT BLK CD-M939-G
25	SZ-361424	PLATE REMOCON
40-B	SM-370750C	NAME PLATE AKAI B2
40-G	SM-370750B-A	NAME PLATE AKAI-G
41	ZW-653163	RING CS 280STL.PKR
42	MT-321129	WIRE BAND B-60
43	MZ-553948	WIRE BAND F-100
44	ZS-310984	PT BR30X08STL CMT
45	ZS-326789	ST PAN30X06STL BNI
46-B	SP-370929B	COVER UPPER B
46-G	SP-370929A	COVER UPPER G
47	ZS-308846	T2BR30X08STL BZN PROJECTION
48	SP-371172	SIDE BOARD (L)
49	SP-371173	SIDE BOARD (R)
50	ZS-365678	SCREW SLIDE TYPE W/WASHER(J)

NOTE
B – Black
G – Gold

11. ACCESARY

Ref. No.	Part No.	Description
1	ZW-202681	WASHER
2	ZZ-302850	LABEL WASHER
3	ZS-331875	PT BR30X12STL CMT
4	ZZ-374173	CORD ∗P2014
5	EW-355829	CORD W/PLUG 3.5 PIN-PIN



Remove the three pick-up locking screws from the bottom of the CD player before attempting to use it.

Save these screws and reinsert them when transporting the CD player over long distances.

INDEX

Part No.	Ref. No.
BA-P2014A030A	1A
BA-P2014A030D	1B
BB-P2016A290A	18B
BB-P2016A290B	1
BB-P2016A290B	18A
BD-B374165A	57-G
BD-B374165B	57-B
BD-P2014A050A	20-B
BD-P2014A050B	20-G
BM-371552	2
BM-371552	1
BM-371552	10
BM-376851	3
BM-376851	37
BO-372165	5
BO-372165	15B
BO-374151	4
BO-374151	15A
BT-368261	8
BT-368261	PT1
BT-374171	7
BT-374171	11A
BT-374172	6
BT-374172	11B
BZ-P2016A240A	44
BZ-P2016A250A	47
EC-338496	C12
ED-301911	12
ED-301911	D5
ED-301911	D6
ED-301911	D7
ED-301911	D8
ED-301911	D11
ED-301911	D12
ED-306724	14
ED-306724	D5
ED-306724	D6
ED-306724	D7
ED-306724	D8
ED-331198	17
ED-331198	D22
ED-338333	18
ED-338333	D21
ED-338333	D10
ED-344280	13
ED-344280	D1
ED-344280	D9
ED-344280	D10
ED-344280	D15
ED-344280	D17
ED-344280	D18
ED-344280	D19
ED-344280	D20
ED-346532	19
ED-346532	D14
ED-346620	16
ED-346620	D9
ED-360409	10
ED-360409	D1
ED-361055	11
ED-361055	D2
ED-361055	D3
ED-361055	D4
ED-370976	9
ED-370976	D201
ED-372125	15
ED-372125	D1
ED-372125	D2
ED-372125	D3
ED-372125	D4
EH-380185J	20
EH-380185J	FL2
EI-315243	30
EI-315243	IC9
EI-348409	34
EI-348409	X3
EI-360040	32
EI-360040	IC16
EI-362977	31
EI-362977	IC10
EI-367271	33
EI-367271	IC1
EI-371079	26
EI-371079	IC1
EI-371082	23
EI-371082	IC3
EI-371091	21
EI-371091	IC15
EI-371544	22
EI-371544	IC4
EI-371554	28
EI-371554	IC2
EI-371570	27
EI-371570	IC7
EI-371579	29
EI-371579	IC8
EI-372196	24
EI-372196	IC6
EI-374176	35
EI-374176	X2
EI-375360	25
EI-375360	IC5
EJ-372185	J2
EJ-372185	J3
EJ-374175	J4
EJ-374191	P1
EM-374177	36
EM-374177	IN1
EO-345902	L6
EO-345922	L5
EO-345924	L1
EO-345931	L2
EO-345931	L4
ER-366452	37
ER-366452	FR1
ES-360576	43
ES-360576	TS1
ES-360576	TS2
ES-360576	TS3
ES-360576	TS4
ES-360576	TS5
ES-360576	TS6
ES-360576	TS7
ES-360576	TS8
ES-360576	TS9
ES-360576	TS10
ES-362883	42
ES-362883	TS11
ES-362883	TS12
ES-362883	TS13
ES-362883	TS14
ES-362883	TS15
ES-362883	TS16
ES-362883	TS17
ES-362883	TS18
ES-362883	TS19
ES-362883	TS20
ES-368075	39
ES-368075	9
ES-368077	40
ES-368077	54
ES-371104	41
ES-371104	SW1
ES-371577	38
ES-371577	31
ET-308141	49
ET-308141	TR5
ET-308141	TR6
ET-308141	TR7
ET-308141	TR12
ET-308141	TR19
ET-308141	TR20
ET-308141	TR24
ET-308141	TR26
ET-308472	46
ET-308472	TR16
ET-308472	TR25
ET-338410	50
ET-338410	TR21
ET-354094	45
ET-354094	TR22
ET-354094	TR23
ET-371075	44
ET-371075	TR8
ET-371075	TR9
ET-371075	TR10
ET-371075	TR11
ET-372197	51
ET-372197	TR1
ET-372197	TR3
ET-372199	48
ET-372199	TR2
ET-372199	TR4
ET-379668J	47
ET-379668J	TR14
EV-356577	VR1
EV-356577	VR2
EV-356577	VR3
EV-356577	VR4
EV-357619	VR5
EW-355829	5
EW-363672	16A
EW-363684	16B
MB-202578	52
MB-202578	3
MR-202576	2
MR-202579	4
MT-321129	42
MZ-202405	14
MZ-202426	12
MZ-202514	20
MZ-202572	38
MZ-202573H03	39
MZ-202575H04	52
MZ-202580	5
MZ-202581	6
MZ-202582H05	7
MZ-370925	14
MZ-553948	43
SA-376945J	2
SC-202557H07	43
SE-375348	7
SK-370688A-A	15-G
SK-370688B-A	15-B
SM-370750B-A	40-G
SM-370750C	40-B
SP-370929A	46-G
SP-370929B	46-B
SP-371172	48
SP-371173	49
SP-378533J1	6A
SP-378534J1	6B
SP-378535J1	6C
SZ-361424	25
SZ-370924	17
SZ-372107	1
ZG-202515	21
ZG-202570H03	32
ZG-202574H02	40
ZG-203098	45
ZG-203099	46
ZS-202631	19
ZS-283353	28
ZS-297641	25
ZS-308673	8
ZS-308846	47
ZS-310984	44
ZS-313796	12
ZS-315511	27
ZS-326789	45
ZS-331875	3
ZS-336351	13
ZS-351186	3
ZS-353355	5
ZS-365329	13
ZS-365353	35
ZS-365678	50
ZS-367436	51
ZS-367463	41
ZS-368088	55
ZS-370834	36
ZS-371013	56
ZS-419782	22
ZW-202681	1
ZW-259650	26
ZW-329299	33
ZW-410051	34
ZW-429120	29
ZW-653163	41
ZZ-302850	2
ZZ-374173	4

ABBREVIATIONS (COMPACT DISC)

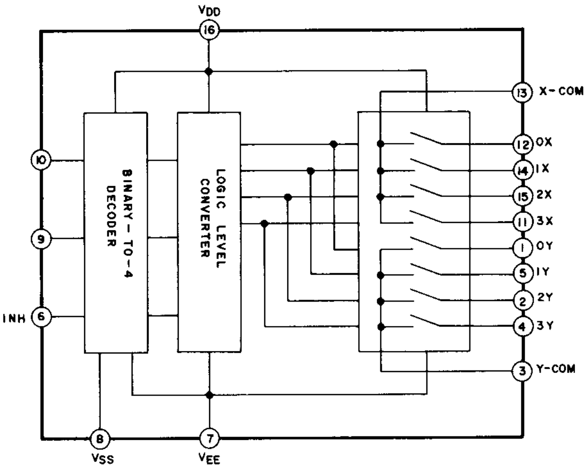
ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
A-D	Analog to Digital (Convertor)	Mb	Mega Bits
ADC	Analog to Digital (Convertor)	MDA	Modulation
BCD	Binary Code Decimal	MFM	Modified Frequency Modulation
BPI	Bits per Inch	MM	Mono-stable Multivibrator
CD	Compact Disc	M : FM	Modified Modified Frequency Modulation
CIRC	Cross Interieaving & Reed Solomon Coding	MOD 2	Module 2 (Addition)
CLV	Constant Linear Velocity	MP	Microprocessor
CP	Clock Pulses	MSB	Most Significant Bit
CRCC	Cyclic Redundancy Check Codes	NA	Numerical Aperture
D Level	Decision Level	NRZ	Non Return to Zero
D-A	Digital to Analog (Convertor)	NRZ-I	Non Return to Zero Inverted
DAC	Digital to Analog (Convertor)	P	Parity Data
DAD	Digital Audio Disk	RAM	Pulse Amplitude Modulation
DEM	Dynamic Element Matching	PCM	Pulse Code Modulation
DPD	Differential Phase Detection	PD	Phase Detector
DSV	Digital Sum Value	PE	PHASE Encode
EFM	Eight to Fourteen Modulation	PLL	Phase Locked Loop
EX-OR	EXclusive OR	PNM	Pulse Number Modulation
FIC	Flux Changes per Inch	PPM	Pulse Phase Modulation
FIR	Finite Impulse Response	PWM	Pulse Width Modulation
FP	Front Pulse	Q	Parity Data
FPG	Front Pulse Gate	R.R$_1$.R$_2$. etc	Data for Right Channel
f	Frequency of Sampling	RAM	Random Access Memory
GF	Galois Field	RPG	Rear Pulse Gate
H & V (Parity)	Horizontal & Vertical	SCOOP	Self Coupled Optical Pick-up
IIR	Infinte Impulse Response	S & H	Sample & Hold
kb	Kilo Bits	S/N	Signal to Noise Ratio
L.L$_1$.L$_2$. etc	Data for Left Channel	SSG	Standerd Signal Generator
LPF	Low Pass Filter	SYS CON	SYStem CONtrol
LSB	Least Significant Bit		

AKAI ELECTRIC CO., LTD.
12-14, 2-Chome, Higashi-Kojiya, Ohta-ku, Tokyo, Japan
TEL: Tokyo (742) 5111 CABLE: HIFIAKAI TOKYO TELEX: J26261
Printed No. 871006-G1-1100 Printed Date: October 28, 1987
350 Printed in Japan

AKAI MODEL CD-M939

SCHEMATIC DIAGRAM AND PC BOARDS

M4052BP MULTIPLEXER



TRUTH TABLE

CONTROL INPUTS			"ON" CHANNEL
INHIBIT	B	A	
L	L	L	0X, 0Y
L	L	H	1X, 1Y
L	H	L	2X, 2Y
L	H	H	3X, 3Y
H	*	*	NONE

* DON'T CARE

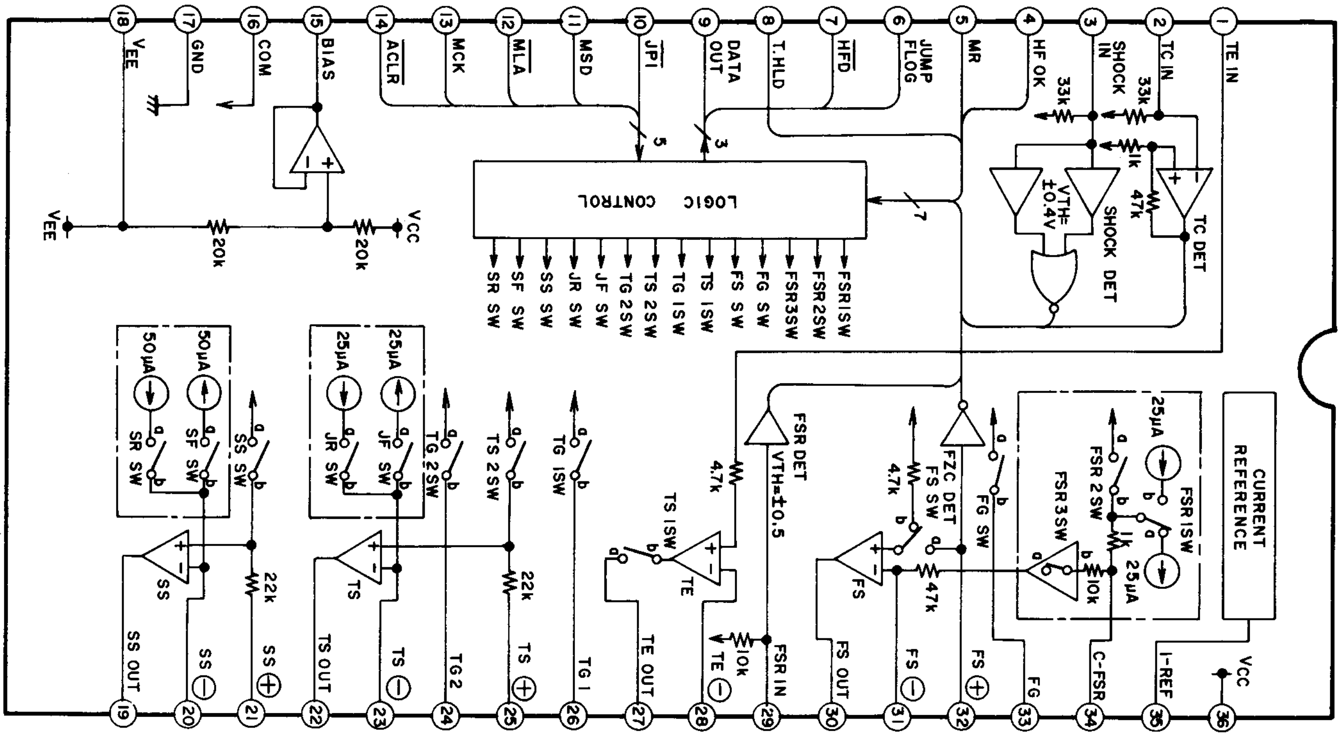
M50421P(SIGNAL PROCESSOR)

PIN NO.	NAME	INPUT/ OUTPUT	FUNCTION
1	DDSCK	O	Delayed DSCK. LRCK Latch clock
3	EMP	O	Enphasis Code output
4	PWM1	O	Power Disc Motor PWM output 1
5	PWM2	O	Power Disc Motor PWM output 2
6	TEST	I	Test Mode Select input
7	DASEL	I	D/A Interface control input
8	DFPAS	I	Degital Filter control input
9	IINH	I	Interporation forbidden mode select input
10	MSD	I	Micro computer interface serial data input
11	MCK	I	Microcomputer interface shift lock input
12	MLA	I	Microcomputer interface Data latch clock input
13	ACLR	I	Micro computer interface Resister clear input
14	HFD	I	Reproducing short signal input
15	HF	I	Reproducing signal input
16	IBEE	I	Detection/PLL reference current input
17	TLC	O	Slice level control output
18	LPF	I/O	PLL loop filter connect
19	SYCLK	O	Frame Sync. statu outputs
20	VDD2	I	Analog Power
22	DRD	O	Law Disc rotate status output
23	EFFK	O	EFM Frame clock output
24	SCOR	O	Sub Code Sync. signal output.
25	CRCF	O	Sub Code Q CR check output
26	SCCK	I	Shift clock (sub code serial output) input
27	SCOE2	I	Sub code parallel output P~Sch enable input
28	SCOE1	I	Sub code parallel output T~Wch enable input
29	Vss2	I	GND
30	SBCW	O	Sub Code Wch output
31	SBCV	O	Sub Code Vch output
32	SBCU	O	Sub Code Uch output
33	SBCT	O	Sub Code Tch output
34	SBCS	O	Sub Code Sch output
35	SBCR	O	Sub Code Rch output
36	SBCQ	O	Sub Code Qch output
37	SBCP	O	Sub Code Pch output
38	RAS	O	Row Address Stroke output
40	RDB2	I/O	External memory address input output 2
42	RDB1	I/O	External memory address input output 1
43	RDB4	I/O	External memory address input output 4
44	CAS	O	Column Address Stroke signal output
45	RDB3	I/O	External memory address input output 3
46	WE	O	Right enable signal output
48	RAD1	O	External memory address output 1
49	RAD2	O	External memory address output 2
50	RAD3	O	External memory address output 3
51	RAD7	O	External memory address output 7
52	RAD4	O	External memory address output 4
53	RAD5	O	External memory address output 5
54	RAD6	O	External memory address output 6
55	RAD0	O	External memory address output 0
56	VDD1	I	Power
57	EST2	O	Error status 2
58	EST1	O	Error status 1
59	C846	O	Clock output 8.4672MHz
60	C423	O	Clock output 4.2336MHz
61	C16MI	I	1/2 divider input
62	C8M0	O	1/2 divider
63	XI	I	Xtal oscillator input
64	X0	O	Xtal oscillator output
65	VSS1	I	GND
66	DOFK	O	OSC Frame clock output 7.35KHz
67	DO	O	D/A converter serial
69	WDCK	O	D/A converter word clock
70	LRCK	O	D/A converter left, right clock
72	DSCK	O	D/A converter shift clock

M50752-402SP SYSTEM CONTROL (MICRO COMPUTER)

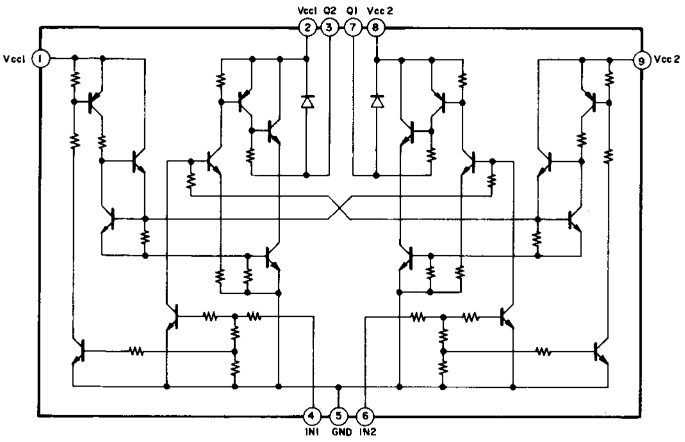
PIN NO.	SYMBOL	I/O	DISCRIPTION
1	OPEN	O	LOADING MOTOR OPEN
2	CLOSE	O	LOADING MOTOR CLOSE
3	$\overline{\text{JPI}}$	O	1 TRACK JUMP CONTROL SIGNAL OUTPUT
4	MSD	O	MICRO COMPUTER SERIAL DATA TRANSFER CLOCK
5	MCK	O	MICRO COMPUTER SERIAL DATA TRANSFER
6	$\overline{\text{MLA}}$	O	MICRO COMPUTER SERIAL DATA LATCH
7	MUTE	–	NOT USED
8	$\overline{\text{ACK}}$	–	NOT USED
9	NC	–	NOT USED
10	DATA IN	I	INTERNAL STATUS INPUT
11	SYCLK	I	FRAME SYNC. STATUS INPUT
12	DRD	I	LAW DISC ROTATE STATUS INPUT
13	SCOR	I	SUB CODE SYNC. SIGNAL INPUT
14	CRCF	I	SUB CODE QCR CHECK INPUT
15	SUBQ	I	SUB CODE Q SIGNAL INPUT
16	KD4	–	
17	$\overline{\text{TEST}}$	I	TEST MODE SELECT INPUT
18	$\overline{\text{STB}}$	–	
19	$\overline{\text{EFFK}}$	I	EFM FRAME CLOCK INPUT
20	NC	–	NOT USED
21	CNVSS	–	GND
22	$\overline{\text{RESET}}$	I	RESET
23	XIN	I	XTAL OSCILLATOR INPUT
24	XOUT F	–	NOT USED
25	XOUT S	–	NOT USED
26	VSS	–	GND
27	XCIN	I	XTAL OSCILLATOR INPUT
28	XCOUT	–	NOT USED
29	KD3	I	KEY INPUT
30	KD2	I	
31	KD1	I	
32	KD0	I	
33	ϕ	–	NOT USED
34	VP	–	–27V
35	LD ON	O	LASER CONTROL SIGNAL OUT
36	G7	O	DISPLAY SIGNAL OUT
37	G6	O	
38	G5	O	
39	G4	O	
40	G3	O	DISPLAY SIGNAL OUT/KEY OUT
41	G2	O	
42	G1	O	
43	i	O	DISPLAY SIGNAL OUT
44	g	O	
45	f	O	
46	e	O	
47	d	O	
48	c	O	
49	b	O	
50	a	O	
51	VCC	–	+5V
52	VCC	–	

M51564P(PICK UP SERVO)


TE IN
TC IN
SHOCK IN
HF OK
MR
JUMP FLOG
HFD
T.HLD
DATA OUT
JP1
MSD
MLA
MCK
ACLR
BIAS
COM
GND
VEE
VEE
VCC
20k
20k
LOGIC CONTROL
5
3
7
SR SW
SF SW
SS SW
JR SW
JF SW
TG 2SW
TS 2SW
TG 1SW
TS 1SW
FS SW
FG SW
FSR3SW
FSR2SW
FSR1SW
33k
33k
1k
47k
VTH=±0.4V
SHOCK DET
TC DET
50μA
50μA
25μA
25μA
SS
TS
TE
FS
22k
22k
4.7k
4.7k
FSR DET
VTH=±0.5
FZC DET
47k
10k
10k
25μA
25μA
CURRENT REFERENCE
SS OUT
SS ⊖
SS ⊕
TS OUT
TS ⊖
TG 2
TS ⊕
TG 1
TE OUT
TE ⊖
FSR IN
FS OUT
FS ⊖
FS ⊕
FG
C-FSR
I-REF
VCC

Pin No.	NAME	Function Block	Input/Output	Function
1	TE IN	Pre. Amp input	I	Tracking error signal input
2	TC IN	Pre. Amp input	I	Track cross signal input
3	SHOCK IN	Pre. Amp input	I	SHOCK detection circuit input
4	HF OK	Pre. Amp input	I	HFOK signal input
5	MR	Pre. Amp input	I	Disc mirror detection signal input
6	JUMP HAG	Micro computer I/O	O	TS OFF·JFJR·BRAKE output (JUMP Mode)
7	HFD	Micro computer I/O	O	MR input = "1" and Track servo loop off HFD = "1"
8	T·HLD	TRACK SERVO	I	TS 1 SW dilect control
9	DATA OUT	Micro computer input	O	Internal status output
10	JP1	Micro computer input	I	1 track jump control signal input
11	MSD	Micro computer input	I	Micro computer serial data transfer clock
12	MLA	Micro computer input	I	Micro computer serial data latch
13	MCK	Micro computer input	I	Micro computer serial data transfer
14	ACLR	Micro computer input	I	Internal register flip-flop all clear
15	BIAS	Power	O	Vcc/2 Bias power output
16	COM	Power	I	COMMON ± Power → GND, one level power → BIAS
17	GND	Power	I	GND pin
18	VEE	Power	I	Minus power, one level power → GND
19	SS OUT	SLIDE SERVO	O	Operational amplifier SS output
20	SS	SLIDE SERVO	I	Operational amplifier SS invert input
21	SS	SLIDE SERVO	I	Operational amplifier SS non-invert input
22	TS OUT	TRACK SERVO	O	Operational amplifier TA output
23	TS	TRACK SERVO	I	Operational amplifier TA invert input
24	TG 2	TRACK SERVO	—	Track gain change switch TG 2 output
25	TS	TRACK SERVO	I	Operational amplifier TA non-invert input
26	TG 1	TRACK SERVO	—	Track gain change switch TG 1 output
27	TE OUT	TRACK SERVO	O	Operational amplifier TE output
28	TE	TRACK SERVO	I	Operational amplifier TE invert input
29	FSR IN	FOCUS SERVO	I	Focus research voltage level detector input
30	FS OUT	FOCUS SERVO	O	Operational amplifier FA output
31	FS	FOCUS SERVO	I	Operational amplifier FA invert input
32	FS	FOCUS SERVO	I	Operational amplifier FA non-invert input
33	FG	FOCUS SERVO	—	Focus gain change switch FG output
34	C·FSR	FOCUS SERVO	—	Focus search wave form time constant condenser
35	I-REF	FOCUS SERVO	I	Connect current setup resistor
36	VCC	Power	I	PLUS power

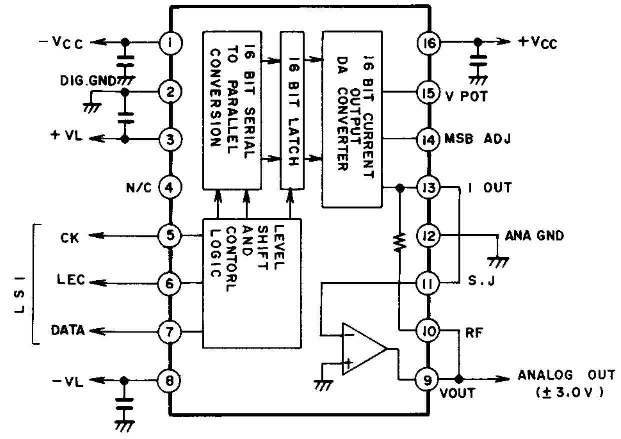
M54544L LOADING DRIVE


Vcc1
Q2
Q1
Vcc2
2
3
7
8
Vcc1
1
9
Vcc2
4
5
6
IN1
GND
IN2

TRUTH TABLE

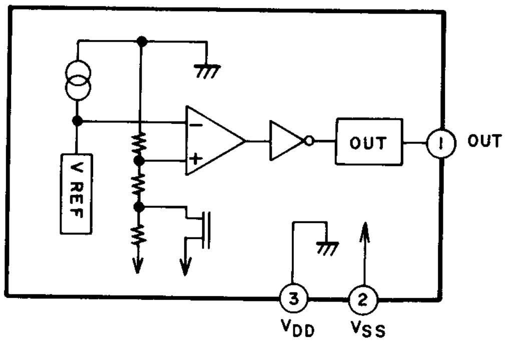
INPUT		OUTPUT		REMARKS
1	2	1	2	
0	0	"OFF" state	"OFF" state	–
1	0	1	0	NORMAL ROTATE
0	1	0	1	RIVERSE ROTATE
1	1	0	0	BRAKE

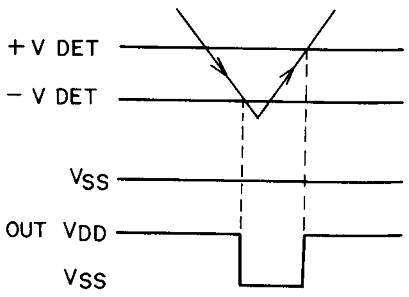
PCM-56PJ 16 BIT D/A CONVERTER

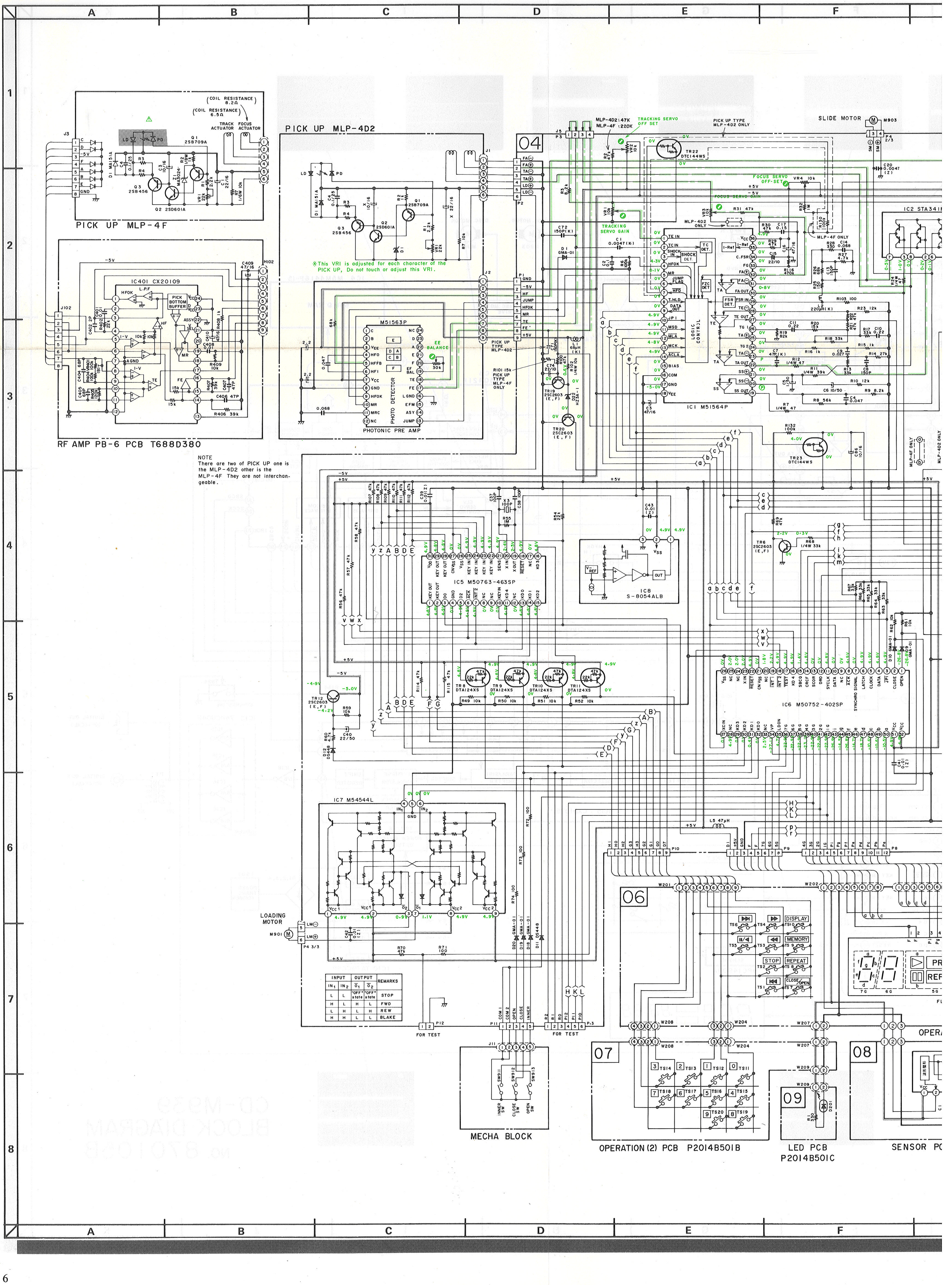

-Vcc
DIG.GND
+VL
N/C
CK
LEC
DATA
-VL
LSI
1
2
3
4
5
6
7
8
16 BIT SERIAL TO PARALLEL CONVERSION
16 BIT LATCH
16 BIT CURRENT OUTPUT DA CONVERTER
LEVEL SHIFT AND CONTORL LOGIC
16
15
14
13
12
11
10
9
+Vcc
V POT
MSB ADJ
I OUT
ANA GND
S.J
RF
VOUT
ANALOG OUT
(± 3.0 V)

PIN NO.	FUNCTION		PIN NO.	FUNCTION	
1	−Vcc	ANALOG ⊖ B	16	+Vcc	ANALOG ⊕ B
2	DIG GND	DEGITAL GND	15	VPOT	POTENTIAL METER
3	+VL	LOGIC ⊕ B	14	MSB ADJ	MSB ADJUSTMENT
4	N C	NO CONNECTION	13	Iout	I OUT
5	CK	CLOCK IN	12	ANA GND	ANALOG GND
6	LEC	LATCH ENABLE CONTROL IN	11	S.J	SUMMING JUNCTION
7	DATA	DATA IN	10	RF	FB REGISTER
8	−VL	LOGIC ⊖ B	9	Vout	V OUT

S8054ALB VOLTAGE DETECTOR

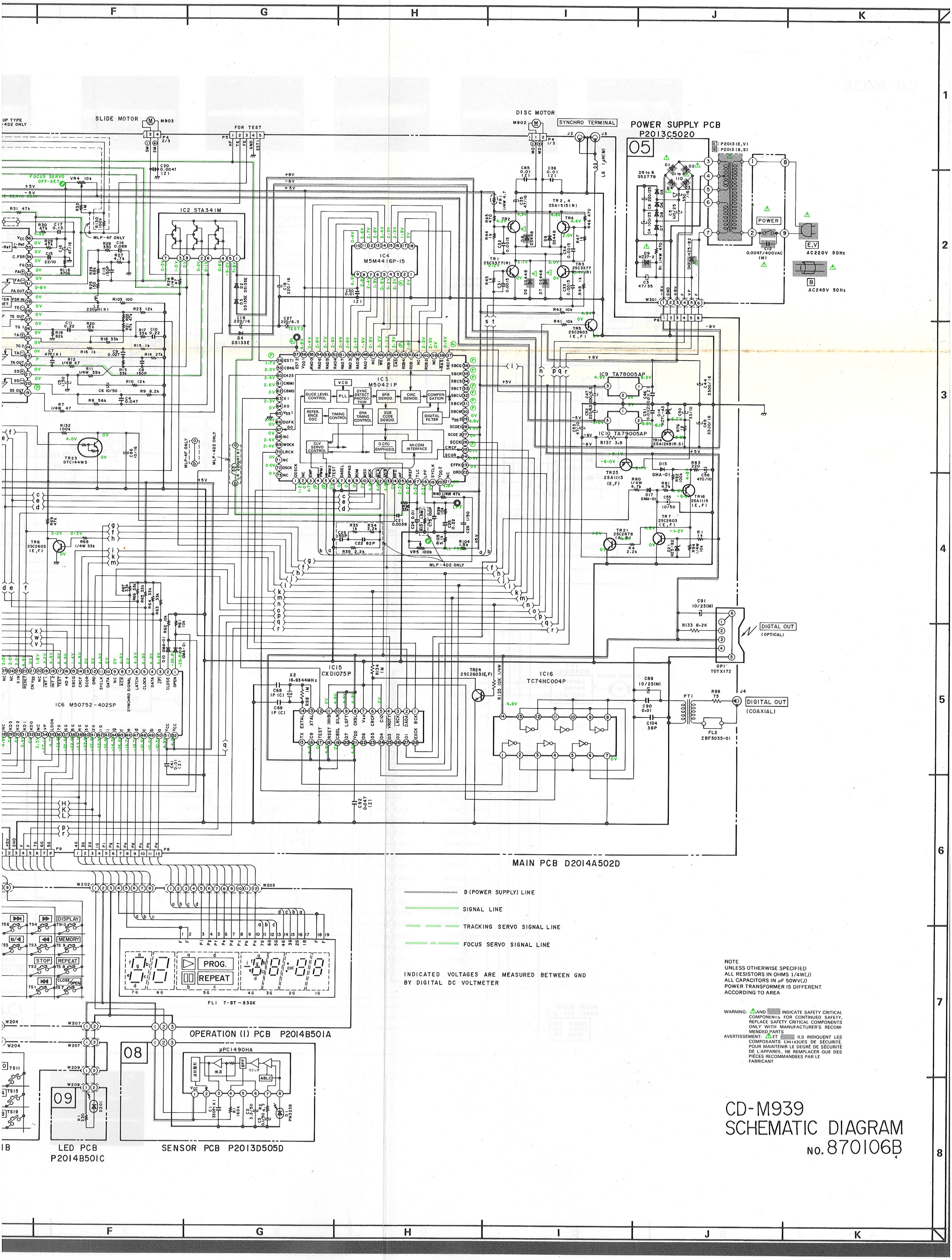

V REF
OUT
1
OUT
3
2
VDD
VSS


+ V DET
− V DET
VSS
OUT VDD
VSS


A
B
C
D
E
F
1
2
3
4
5
6
7
8
PICK UP MLP-4F
(COIL RESISTANCE 8.2Ω)
(COIL RESISTANCE 6.5Ω)
TRACK ACTUATOR
FOCUS ACTUATOR
PICK UP MLP-4D2
※This VR1 is adjusted for each character of the PICK UP, Do not touch or adjust this VR1.
M51563P
PHOTO DETECTOR
PHOTONIC PRE AMP
EE BALANCE
IC401 CX20109
RF AMP PB-6 PCB T688D380
04
MLP-4D2:47K
MLP-4F :220K
TRACKING SERVO OFF SET
TRACKING SERVO GAIN
FOCUS SERVO OFF-SET
FOCUS SERVO GAIN
PICK UP TYPE MLP-4D2 ONLY
MLP-4F ONLY
SLIDE MOTOR M903
IC2 STA341
IC1 M51564P
LOGIC CONTROL
TR22 DTC144WS
TR23 DTC144WS
IC8 S-8054ALB
IC5 M50763-463SP
IC6 M50752-402SP
TR8 DTA124XS
TR9 DTA124XS
TR10 DTA124XS
TR11 DTA124XS
TR12 2SC2603 (E,F)
TR6 2SC2603 (E,F)
TR19 2SC2603 (E,F)
TR20 2SC2603 (E,F)
IC7 M54544L
LOADING MOTOR
M901
P4 3/3
FOR TEST
MECHA BLOCK
INNER SW
CLOSE SW
OPEN SW
06
07
08
09
DISPLAY
MEMORY
STOP
REPEAT
OPERATION (2) PCB P2014B501B
LED PCB P2014B501C
SENSOR PC
OPERA

NOTE
There are two of PICK UP one is the MLP-4D2 other is the MLP-4F They are not interchangeable.

INPUT		OUTPUT		REMARKS
IN_1	IN_2	$\overline{O}_1$	$\overline{O}_2$	
L	L	"OFF" state	"OFF" state	STOP
H	L	H	L	FWD
L	H	L	H	REW
H	H	L	L	BLAKE


F
G
H
I
J
K
1
2
3
4
5
6
7
8
SLIDE MOTOR
M903
FOR TEST
DISC MOTOR
M902
SYNCHRO TERMINAL
POWER SUPPLY PCB
P2013C5020
05
E: P2013(E,V)
B: P2013(B,S)
POWER
E.V
AC220V 50Hz
B
AC240V 50Hz
FOCUS SERVO OFF-SET
IC2 STA341M
IC4 M5M4416P-15
IC3 M50421P
SLICE LEVEL CONTROL
VCO
PLL
SYNC DETECT PROTECTION
EFM DEMOD.
CIRC DEMOD.
COMPENSATION
REFERENCE OSC
TIMING CONTROL
EFM TIMING CONTROL
SUB CODE DEMOD.
DIGITAL FILTER
CLV SERVO CONTROL
Q.CRC EMPHASIS
MI-COM INTERFACE
IC9 TA78005AP
IC10 TA79005AP
MLP-4F ONLY
MLP-402 ONLY
IC5 CXD1075P
IC16 TC74HC004P
IC6 M50752-402SP
DIGITAL OUT (OPTICAL)
DIGITAL OUT (COAXIAL)
OPT TOTX172
MAIN PCB D2014A502D
PROG.
REPEAT
FL1 7-BT-83GK
DISPLAY
MEMORY
STOP
REPEAT
CLOSE OPEN
OPERATION (I) PCB P2014B501A
08
μPC1490HA
09
LED PCB
P2014B501C
SENSOR PCB P2013D505D

B (POWER SUPPLY) LINE

SIGNAL LINE

TRACKING SERVO SIGNAL LINE

FOCUS SERVO SIGNAL LINE

INDICATED VOLTAGES ARE MEASURED BETWEEN GND BY DIGITAL DC VOLTMETER

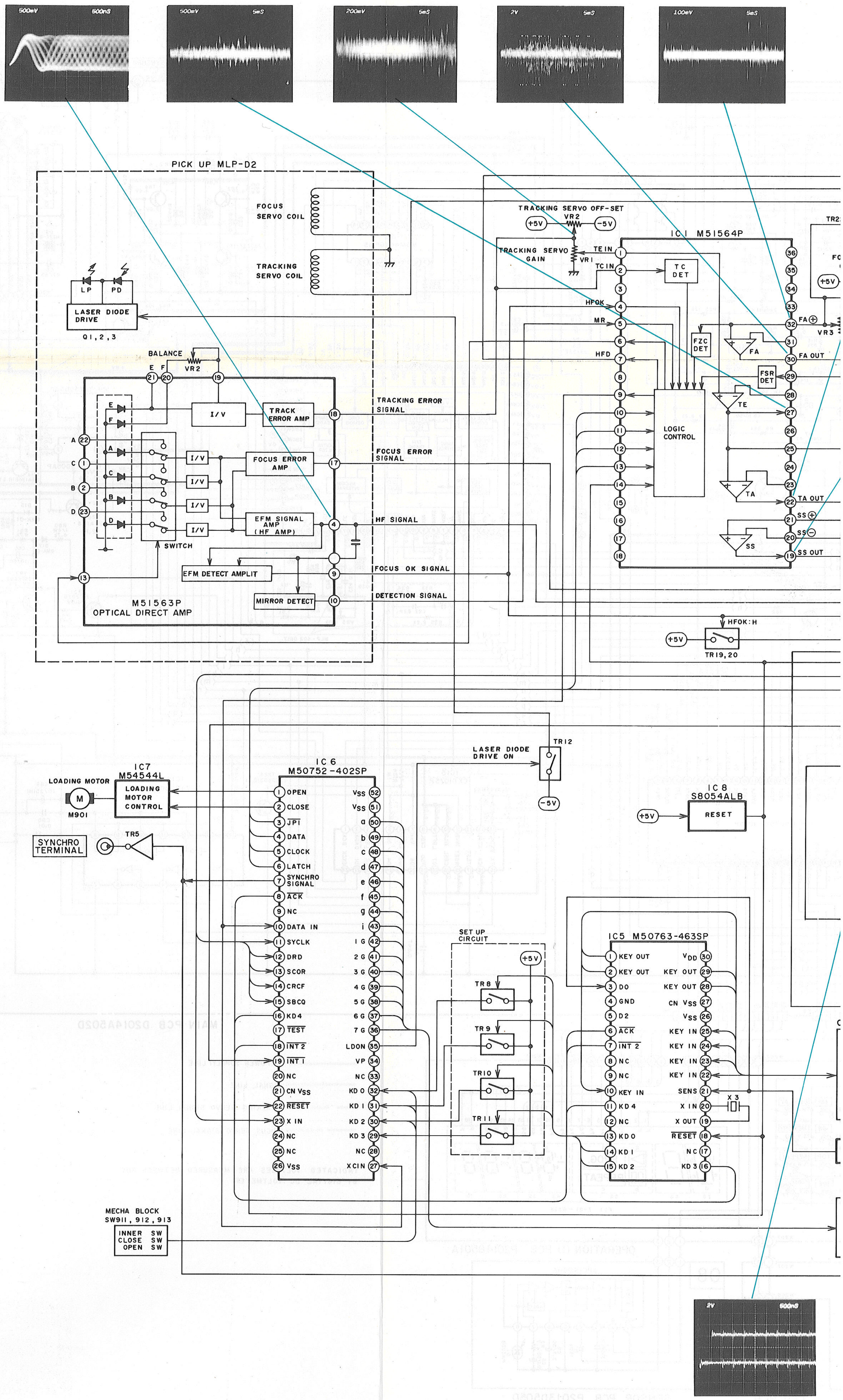
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT
ACCORDING TO AREA

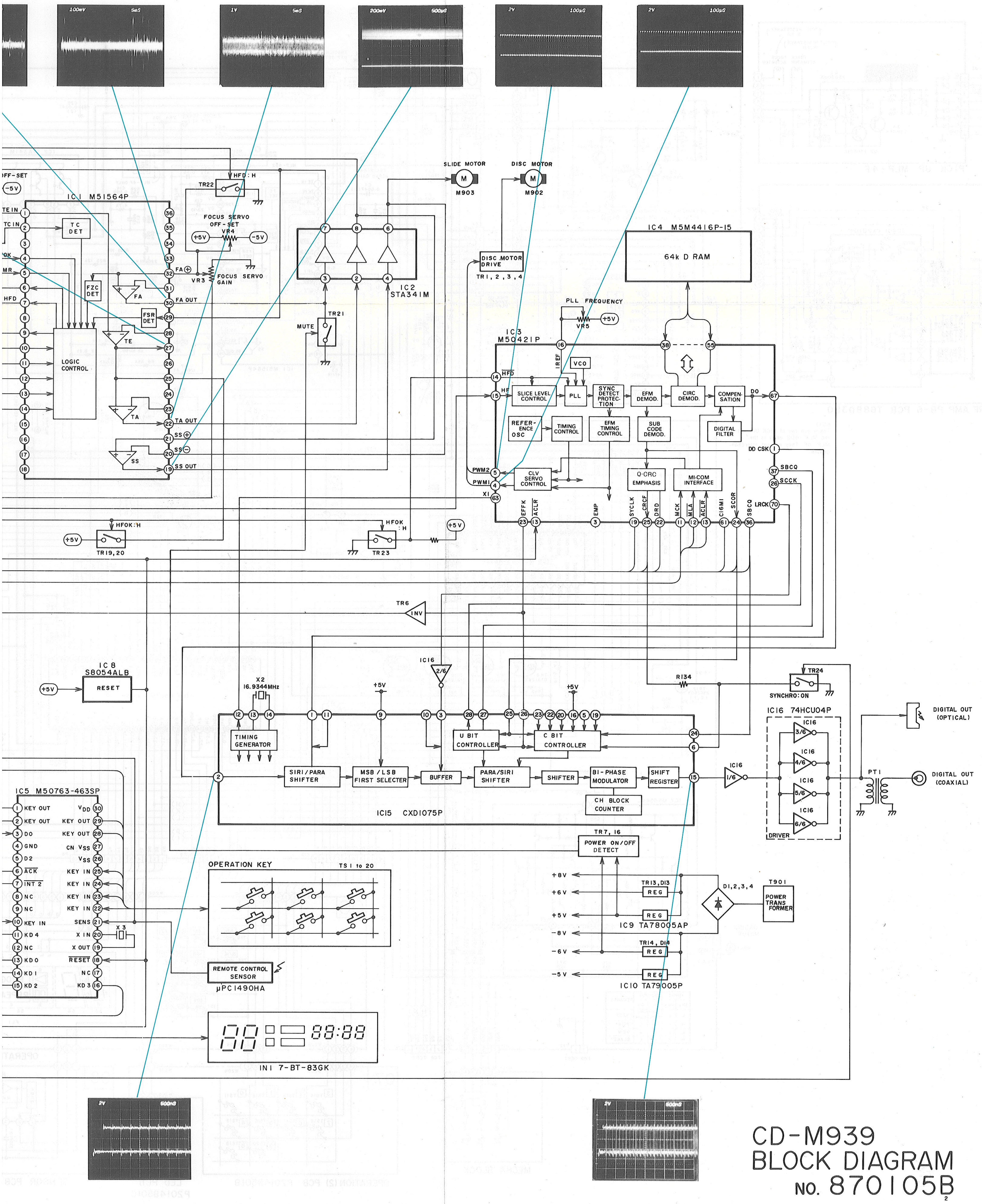
WARNING: ⚠ AND ▨ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ ET ▨ ILS INDIQUENT LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

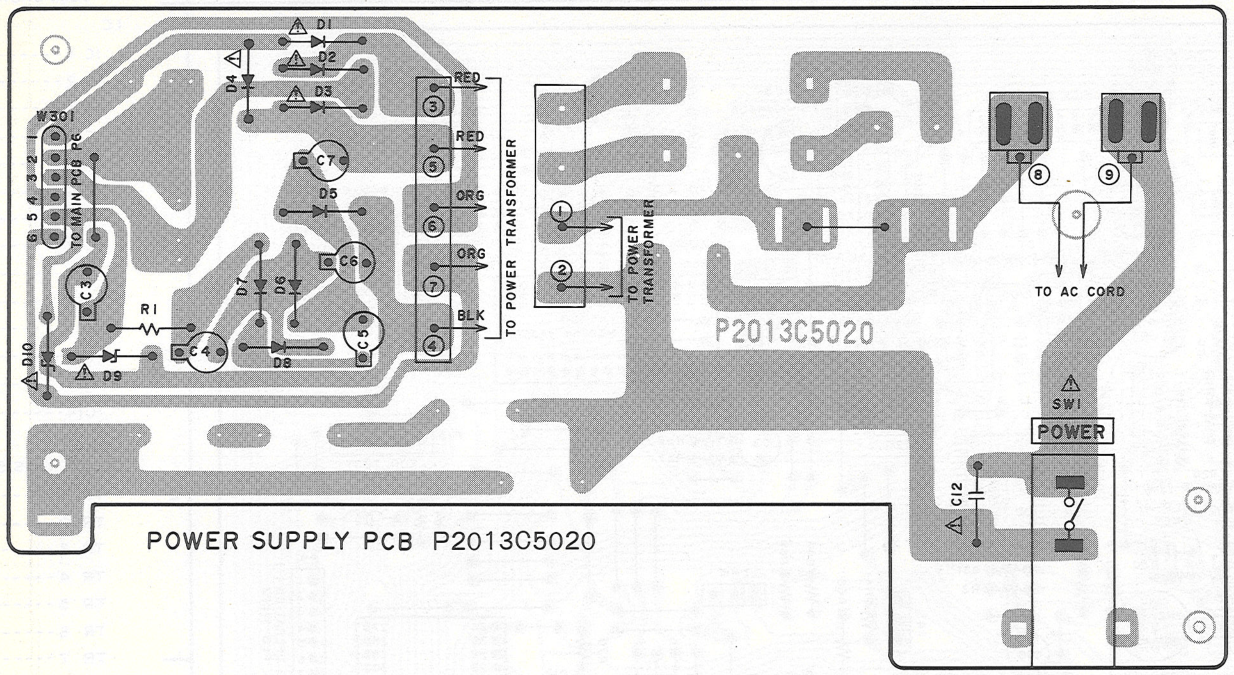
CD-M939
SCHEMATIC DIAGRAM
NO. 870106B

CD-M939


A
B
C
D
E
F
1
2
3
4
5
6
7
8
500mV 500nS
500mV 5mS
200mV 5mS
2V 5mS
100mV 5mS
PICK UP MLP-D2
FOCUS SERVO COIL
TRACKING SERVO COIL
LP
PD
LASER DIODE DRIVE
Q1, 2, 3
BALANCE
VR2
E
F
21
20
19
A 22
C 1
B 2
D 23
I/V
TRACK ERROR AMP
18
FOCUS ERROR AMP
17
EFM SIGNAL AMP (HF AMP)
4
SWITCH
EFM DETECT AMPLIT
9
MIRROR DETECT
10
13
M51563P
OPTICAL DIRECT AMP
TRACKING ERROR SIGNAL
FOCUS ERROR SIGNAL
HF SIGNAL
FOCUS OK SIGNAL
DETECTION SIGNAL
TRACKING SERVO OFF-SET
VR2
+5V
-5V
TRACKING SERVO GAIN
VR1
TE IN
TC IN
HFOK
MR
HFD
IC1 M51564P
TC DET
FZC DET
FSR DET
FA
TE
TA
SS
LOGIC CONTROL
FA⊕
VR3
FA OUT
TA OUT
SS⊕
SS⊖
SS OUT
TR2
+5V
HFOK:H
TR19, 20
LASER DIODE DRIVE ON
TR12
IC8 S8054ALB
RESET
IC7 M54544L
LOADING MOTOR
M
M901
LOADING MOTOR CONTROL
SYNCHRO TERMINAL
TR5
IC6 M50752-402SP
1 OPEN
2 CLOSE
3 JP1
4 DATA
5 CLOCK
6 LATCH
7 SYNCHRO SIGNAL
8 ACK
9 NC
10 DATA IN
11 SYCLK
12 DRD
13 SCOR
14 CRCF
15 SBCQ
16 KD4
17 TEST
18 INT2
19 INT1
20 NC
21 CN VSS
22 RESET
23 X IN
24 NC
25 NC
26 VSS
VSS 52
VSS 51
a 50
b 49
c 48
d 47
e 46
f 45
g 44
i 43
1G 42
2G 41
3G 40
4G 39
5G 38
6G 37
7G 36
LDON 35
VP 34
NC 33
KD0 32
KD1 31
KD2 30
KD3 29
NC 28
XCIN 27
SET UP CIRCUIT
TR8
TR9
TR10
TR11
IC5 M50763-463SP
1 KEY OUT
2 KEY OUT
3 DO
4 GND
5 D2
6 ACK
7 INT2
8 NC
9 NC
10 KEY IN
11 KD4
12 NC
13 KD0
14 KD1
15 KD2
VDD 30
KEY OUT 29
KEY OUT 28
CN VSS 27
VSS 26
KEY IN 25
KEY IN 24
KEY IN 23
KEY IN 22
SENS 21
X IN 20
X OUT 19
RESET 18
NC 17
KD3 16
X3
MECHA BLOCK SW911, 912, 913
INNER SW
CLOSE SW
OPEN SW
2V 500nS


F
G
H
I
J
K
1
2
3
4
5
6
7
8
100mV 5mS
1V 5mS
200mV 500µS
2V 100µS
2V 100µS
OFF-SET
-5V
IC1 M51564P
TE IN
TC IN
OK
MR
HFD
TC DET
FZC DET
FA
FSR DET
TE
LOGIC CONTROL
TA
SS
FA⊕
FA OUT
TA OUT
SS⊕
SS⊖
SS OUT
TR22
HFD : H
FOCUS SERVO OFF-SET
VR4
+5V
-5V
VR3
FOCUS SERVO GAIN
IC2 STA341M
TR21
MUTE
SLIDE MOTOR
M903
DISC MOTOR
M902
DISC MOTOR DRIVE
TR1, 2, 3, 4
IC4 M5M4416P-15
64k D RAM
PLL FREQUENCY
VR5
+5V
IC3 M50421P
IREF
VCO
HFD
HF
SLICE LEVEL CONTROL
PLL
SYNC DETECT PROTEC-TION
EFM DEMOD.
CIRC DEMOD.
COMPEN-SATION
DO
REFER-ENCE OSC
TIMING CONTROL
EFM TIMING CONTROL
SUB CODE DEMOD.
DIGITAL FILTER
DD CSK
SBCQ
SCCK
LRCK
PWM2
PWM1
XI
CLV SERVO CONTROL
Q-CRC EMPHASIS
MI-COM INTERFACE
EFFK
ACLR
EMP
SYCLK
CRCF
DRD
MCK
MLA
ACLR
CI6MI
SCOR
SBCQ
HFOK : H
+5V
TR19, 20
HFOK : H
TR23
+5V
TR6
INV
IC8 S8054ALB
+5V
RESET
IC16
2/6
X2 16.9344MHz
+5V
+5V
TIMING GENERATOR
SIRI/PARA SHIFTER
MSB/LSB FIRST SELECTER
BUFFER
U BIT CONTROLLER
C BIT CONTROLLER
PARA/SIRI SHIFTER
SHIFTER
BI-PHASE MODULATOR
SHIFT REGISTER
CH BLOCK COUNTER
IC15 CXD1075P
R134
TR24
SYNCHRO : ON
IC16 74HCU04P
IC16
3/6
4/6
5/6
6/6
1/6
DRIVER
PT1
DIGITAL OUT (OPTICAL)
DIGITAL OUT (COAXIAL)
IC5 M50763-463SP
KEY OUT
KEY OUT
DO
GND
D2
ACK
INT 2
NC
NC
KEY IN
KD 4
NC
KD0
KD1
KD2
VDD
KEY OUT
KEY OUT
CN VSS
VSS
KEY IN
KEY IN
KEY IN
KEY IN
SENS
X IN
X OUT
RESET
NC
KD3
X3
OPERATION KEY
TS1 to 20
REMOTE CONTROL SENSOR
µPC1490HA
IN1 7-BT-83GK
88:88
TR7, 16
POWER ON/OFF DETECT
+8V
+6V
+5V
-8V
-6V
-5V
TR13, D13
REG
REG
IC9 TA78005AP
TR14, D14
REG
REG
IC10 TA79005P
D1, 2, 3, 4
T901
POWER TRANS FORMER
2V 500nS
2V 500nS

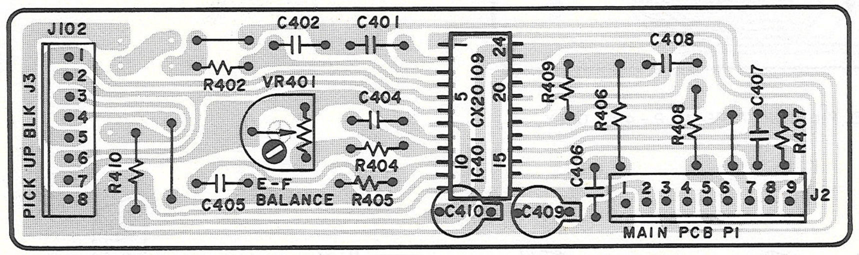
CD-M939
BLOCK DIAGRAM
NO. 870105B


W301
6 5 4 3 2 1
TO MAIN PCB P6
D1
D2
D3
D4
C7
D5
C6
C3
R1
D7
D6
C4
C5
D8
D9
D10
RED
RED
ORG
ORG
BLK
③
⑤
⑥
⑦
④
TO POWER TRANSFORMER
①
②
TO POWER TRANSFORMER
⑧
⑨
TO AC CORD
P2013C5020
SW1
POWER
C12

POWER SUPPLY PCB P2013C5020

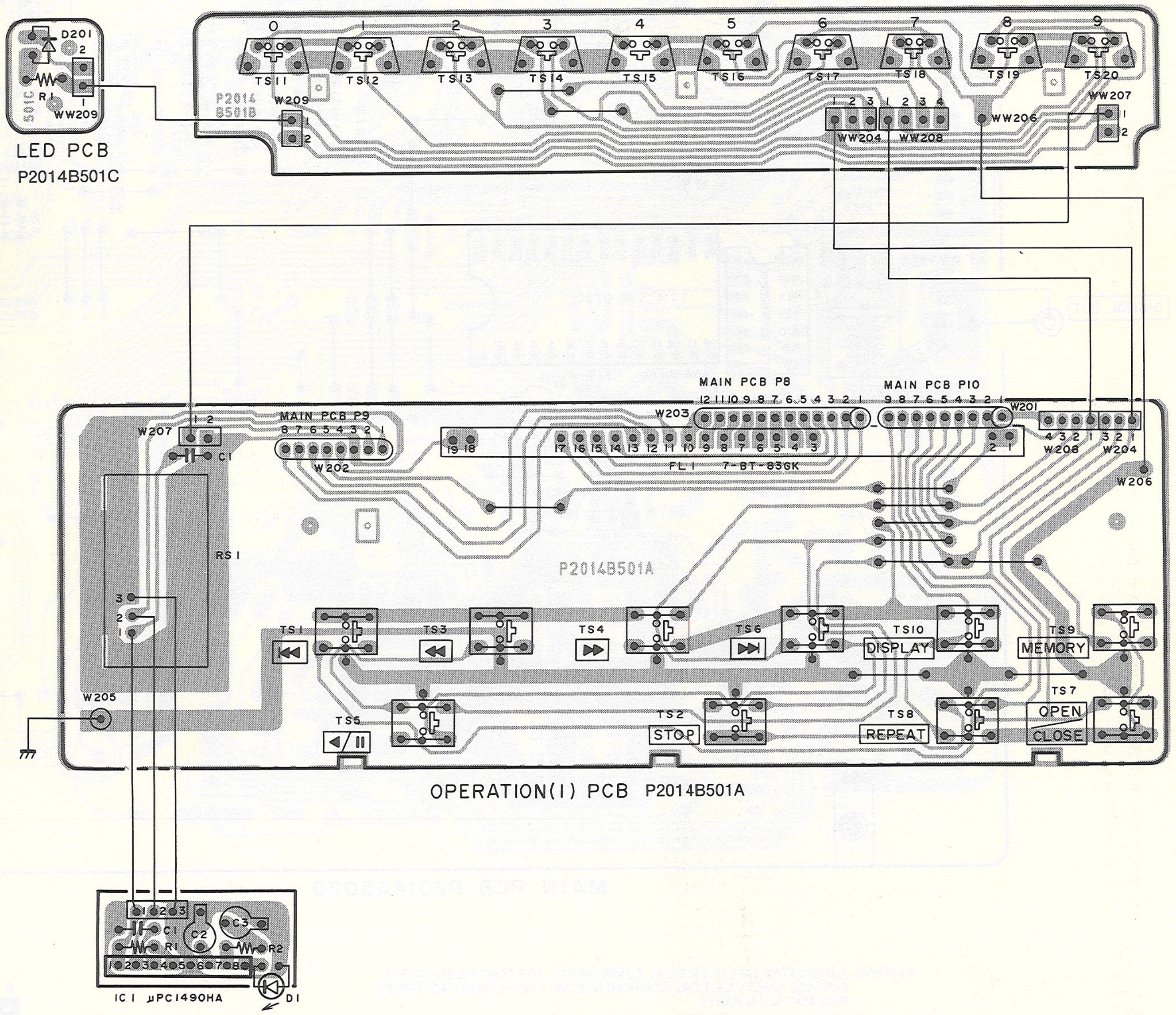
WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT


J102
1 2 3 4 5 6 7 8
PICK UP BLK J3
C402
C401
R402
VR401
C404
R404
E-F BALANCE
C405
R405
R410
IC401 CX20109
1
10
5
15
20
24
R409
R406
R408
C408
C407
R407
C406
C410
C409
1 2 3 4 5 6 7 8 9
J2
MAIN PCB P1

RF-AMP PCB

(PICK UP TYPE MLP-4F ONLY)

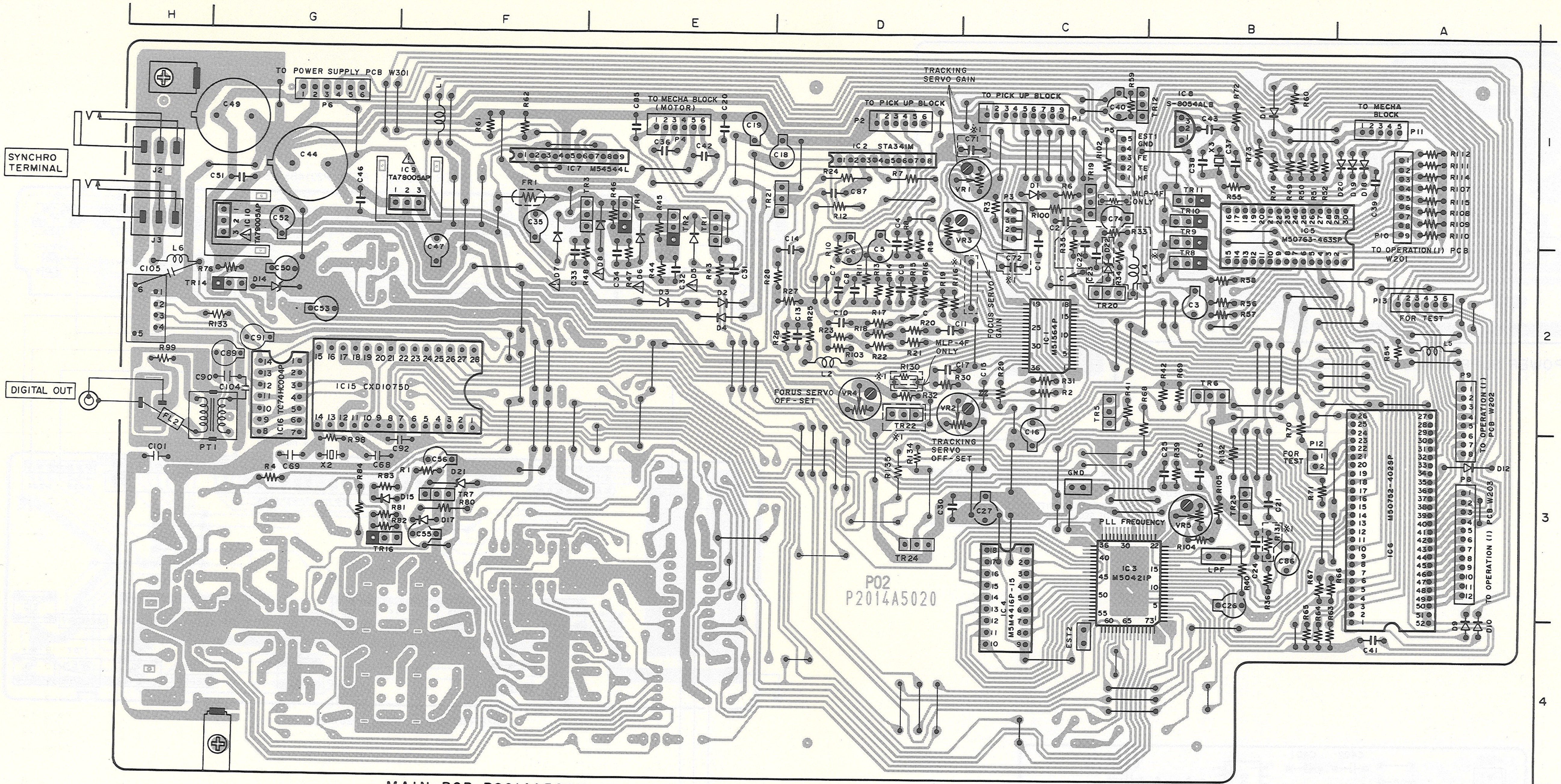

D201
R1
WW209
501C
0 1 2 3 4 5 6 7 8 9
TS11
TS12
TS13
TS14
TS15
TS16
TS17
TS18
TS19
TS20
P2014 B501B
W209
WW204
WW208
WW206
WW207
MAIN PCB P8
MAIN PCB P10
MAIN PCB P9
W203
W201
W202
W207
C1
FL1 7-BT-83GK
W208
W204
W206
RS1
P2014B501A
TS1
TS3
TS4
TS6
TS10
DISPLAY
TS9
MEMORY
TS7
OPEN
CLOSE
TS5
TS2
STOP
TS8
REPEAT
W205
C1
C2
C3
R1
R2
D1
IC1 μPC1490HA

OPERATION (2) PCB P2014B501B

LED PCB
P2014B501C

OPERATION (1) PCB P2014B501A

SENSER PCB
P2013D5050


H
G
F
E
D
C
B
A
1
2
3
4
SYNCHRO TERMINAL
J2
J3
DIGITAL OUT
TO POWER SUPPLY PCB W301
P6
IC9 TA78005AP
IC10 TA78005AP
IC7 M54544L
TO MECHA BLOCK (MOTOR)
P4
TO PICK UP BLOCK
P2
IC2 STA341M
TRACKING SERVO GAIN
TO PICK UP BLOCK
P1
IC8 S-8054ALB
TO MECHA BLOCK
P11
EST1 GND FE TE HF
P5
MLP-4F ONLY
IC5 M50763-463SP
TO OPERATION (1) PCB W201
P10
P13
FOR TEST
FOCUS SERVO GAIN
IC M51564P
MLP-4F ONLY
FOCUS SERVO OFF-SET
TRACKING SERVO OFF-SET
IC15 CXD1075D
IC16 TC74HC04P
PT1
FL2
X2
GND
PLL FREQUENCY
IC3 M50421P
LPF
IC4 M5M4416P-15
EST2
IC6 M50782-402SP
TO OPERATION (1) PCB W202
P9
P8
TO OPERATION (1) PCB W203
FOR TEST
P12
P02
P2014A5020

MAIN PCB P2014A5020

※1 [ ] : WHEN USING THE PICK UP TYPE MLP-4D2 ONLY.

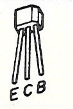
WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

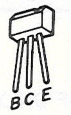
B
■○○ PNP TRANSISTOR

B
○○○ NPN TRANSISTOR

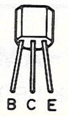
D G S
○○○ FET



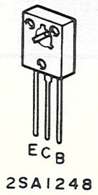
2SA1115
2SC2603
DTC144WS



DTA124XS



2SC3383
2SC2878
2SC3377
2SA1515



2SA1248
2SC3116

LOCATION OF COMPONENT

IC

IC 1	C2
IC 2	D1
IC 3	C3
IC 4	C3
IC 5	B1
IC 6	A3
IC 7	F1
IC 8	B1
IC 9	F1
IC10	G1
IC11	E3
IC12	F3
IC13	F4
IC14	G3

TRANSISTOR

TR 1	E1
TR 2	E1
TR 3	E1
TR 4	E1
TR 5	C2
TR 6	B2
TR 7	F3
TR 8	B2
TR 9	B1
TR10	B1
TR11	B1
TR12	B1
TR13	G2
TR14	G2
TR15	E4
TR16	G3
TR17	G3
TR17b	G4
TR18	H3
TR18b	G3
TR19	C1
TR20	C2
TR21	D1
TR22	D2
TR23	B3
TR25	G2
TR26	G2

CONNECTOR

P 1	C1
P 2	D1
P 3	C1
P 4	E1
P 5	C1
P 6	G1
P 7	E4
P 8	A3
P 9	A2
P10	A1
P11	A1
P12	B3
P13	A2